APRIL, 1952

Railway Engineering and Maintenance

NOW A NEW AND *IMPROVED* RELIANCE FROG AND CROSSING HY-CROME SPRING WASHER

For many years maintaining tight bolts in Frogs, Switches and Crossings has presented a difficult problem because of the constant pounding of two or three way traffic over a typical mainline crossing. Spring Washers have been of considerable help in meeting this condition, but it has been emphasized by experienced Track Maintenance Engineers how valuable it would be to have available a specially designed spring washer which would more successfully meet the demands of such installations.

The improved Reliance Frog and Crossing Hy-Crome Spring Washers are the latest development in Spring Washers for this particular type of application or similar application. Through laboratory experiments and actual service tests, the design of the Reliance Frog and Crossing Hy-Crome Spring Washer has been developed. Their automatic mechanical action and helical form will only flatten at a sufficient predetermined applied load. A wide range of reaction and adequate pressure provides constant tension, pending maintenance tightenings and help eliminate failures occurring from service wear or bolted parts.

Their design provides the crossing nuts with the necessary bearing surface, and ground deflected ends make reapplication possible without damaging the contacting parts. The Reliance Frog and Crossing Hy-Crome Spring Washer is available in sizes for the 1⅛", 1¼", 1⅜", and 1½" thread diameter bolts. Our railroad spring washer engineers welcome the opportunity to supply you with additional data and to discuss a test installation.

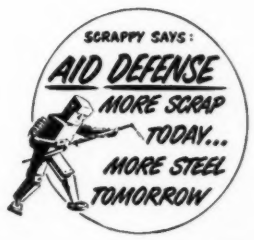
EATON

MANUFACTURING COMPANY, RELIANCE DIVISION

OFFICE AND PLANTS • MASSILLON, OHIO

SALES OFFICES: NEW YORK • CLEVELAND • DETROIT • CHICAGO • ST. LOUIS
SAN FRANCISCO • MONTREAL

Grandpa Never Threw a Thing Away



It's only human to want to hold on to things after they've outlived their usefulness. That's why today millions of tons of worn-out and obsolete equipment and machinery are lying forgotten in the country's plants and factories and on farms.

The steel industry needs these millions of tons of dormant scrap, needs it in the worst way. With this vital dormant scrap the entire steel supply picture would brighten up, with more steel for everybody. But without it, the steel industry cannot hope to keep up production at present levels.

Call in a scrap dealer now, today. He will buy your dormant scrap and start it moving toward the steel mills.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

More Scrap Today... More Steel Tomorrow

Published monthly by Simmons-Boardman Publishing Corporation, 79 W. Monroe St., Chicago 3, Ill. Subscription price: United States and Possessions, and Canada, one year $2.00 (special rate to railroad employees only, one year $1.00). Single copies 50 cents. Entered as second-class matter January 20, 1933, at the post office at Chicago, Ill., under the act of March 3, 1879, with additional entry at Bristol, Conn. Volume 48, No. 4.

For additional information, use postcard, pages 367-368

they're
custom-built
to fit the job!

Work boats, pleasure craft

Drilling rigs, centrifugal pumps, generator sets

Earthmovers, logging yarders and loaders

Buses and highway trucks

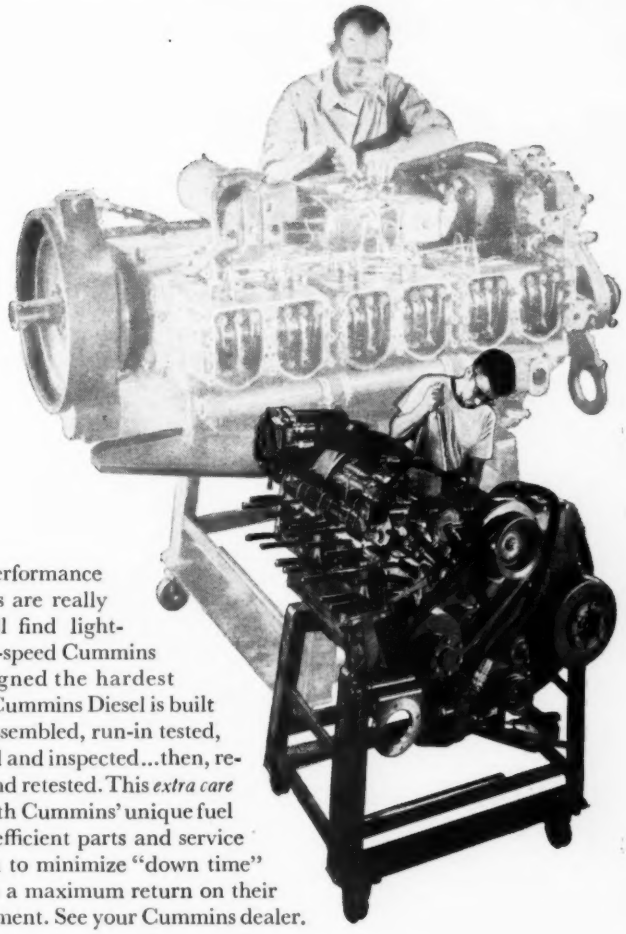
Off-highway trucks, crawler tractors

Shovels, cranes, industrial locomotives and switchers

Lightweight, high-speed Diesels (50-550 hp) for these and many other uses

Cummins® Diesels do so many jobs so much better

they're
BUILT NOT ONCE BUT TWICE



Wherever performance requirements are really rough, you'll find lightweight, high-speed Cummins Diesels assigned the hardest jobs. Every Cummins Diesel is built *TWICE*—assembled, run-in tested, disassembled and inspected...then, reassembled and retested. This *extra care* combines with Cummins' unique fuel system and efficient parts and service organization to minimize "down time" ...give users a maximum return on their diesel investment. See your Cummins dealer.

CUMMINS Dependable DIESEL

TRADEMARK REG. U.S. PAT. OFF.

Diesel power by CUMMINS

CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA

Export: Cummins Diesel Export Corporation • Columbus, Indiana, U.S.A. • Cable: Cumdiex

All in a day's work for rubber-tired

Travels along or across tracks . . . drives anywhere along right-of-way without planking. Flexible tires straddle rails . . . do not damage ballast . . . ride on ties without chamfering, thus saving maintenance. Tough tread lugs and sturdy rayon cords absorb shocks . . . tires easily flex, and roll over obstacles instead of grinding through them.

All-year materials handling . . . On shuttle operations, Tournadozer stockpiles coal, sand, cinders, chemicals and other materials more economically than crawler dozers. With faster forward and reverse speeds, it can handle 2 to 3 times more yards per hour the year-'round. Husky, two-foot wide, low-pressure tires assure safe compaction of combustible materials without reducing them to fines.

In less than 4 minutes,

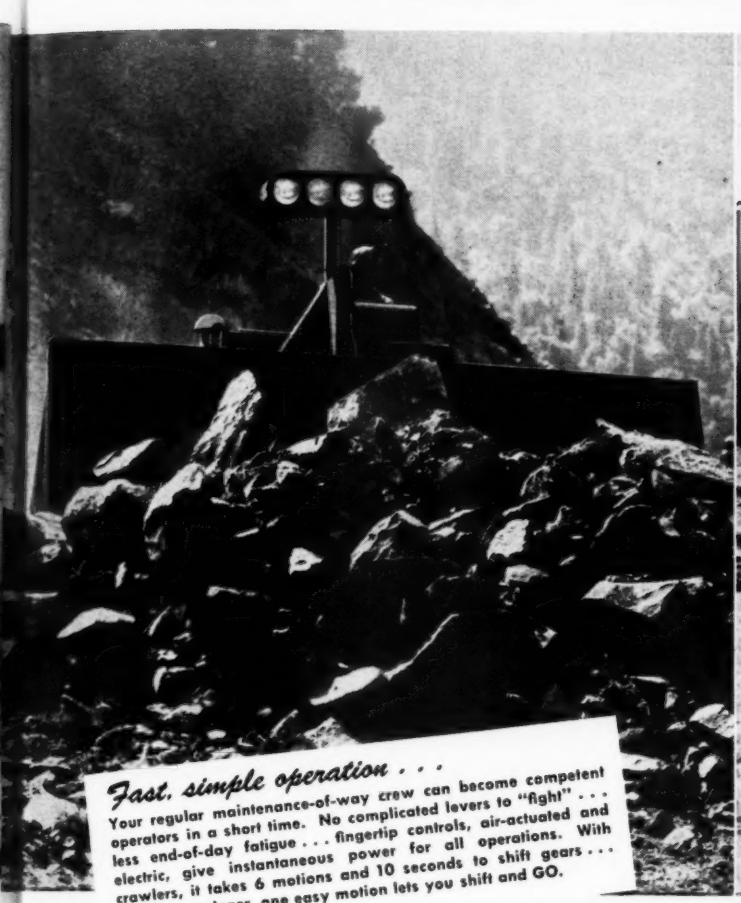
this highly mobile dozer travels a mile under its own power to handle any railroad maintenance job in your yard or along the right-of-way. Ready to run at a moment's notice, independent of trailer delays or expenses, rubber-tired Tournadozer can be driven via any surface to job at 19 m.p.h. And, it's ready to go to work right away!

Crossing tracks and riding over ties without danger of chamfering, Tournadozer easily spreads cinders around your yard or roundhouse, highballs out to clean drainage ditches, remove slides, cut down banks, fill washouts, reinforce causeways or bridge approaches . . . one operator and one Tournadozer can do many of these and similar maintenance tasks *in a single day.*

Cuts dozing time in half

Tournadozer not only gets to jobs in less time . . . it also finishes them sooner. Rig moves fast in tough footings

railroad Tournadozer



Fast, simple operation . . .

Your regular maintenance-of-way crew can become competent operators in a short time. No complicated levers to "fight" . . . less end-of-day fatigue . . . fingertip controls, air-actuated and electric, give instantaneous power for all operations. With crawlers, it takes 6 motions and 10 seconds to shift gears . . . with Tournadozer, one easy motion lets you shift and GO.

Handy in emergencies . . .

Tournadozer can do emergency switching or spot work train cars. This versatile off-track, on-track, cross-track rig can also quickly remove slides, fill washouts, clean up at wrecks, straighten tracks, reinforce causeways and bridge approaches. Rig requires no work train or crew . . . easily drives off right-of-way at approach of train to eliminate tie-up of rail traffic.

with big 2½ yd. load . . . backs up fast for next pass. Four speeds forward to 19 m.p.h. and two speeds in reverse up to 8 m.p.h. help you complete each dozing cycle in about one-half the time it takes the average crawler.

No stopping to change gears

Instant gear changes with constant-mesh transmission plus torque converter (optional), and simplified operating controls put Tournadozer's constant power to work without loss of momentum. In addition, 186 h.p. four-wheel drive on 21.00 x 25 low-pressure tires means plenty of power and traction to hang on and move heavy loads even in toughest going. Down pressure now available on rig's big 2½-yard blade, helps get quick penetration in wet-frozen sand, clay, hardpan, etc. All these modern advantages contribute to more work done in all kinds of weather, every day of the year.

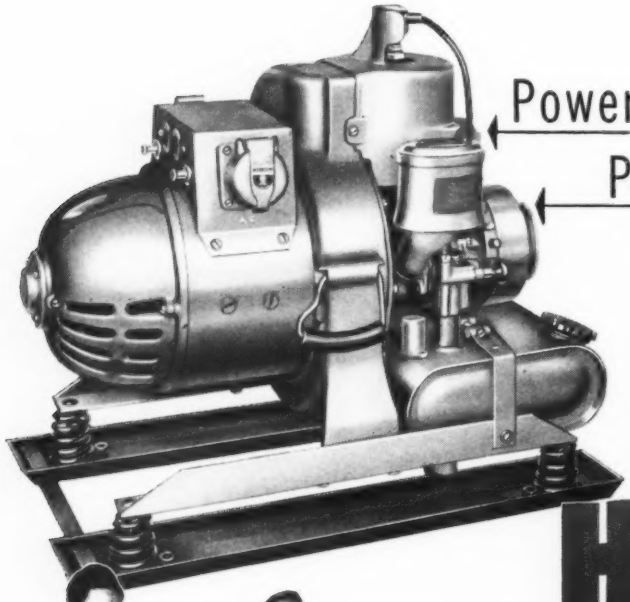
Tournadozer's 19 m.p.h. "run-about" mobility, its job-proved work ability and its low operating upkeep make it the kind of tool you need for your maintenance tasks. Compare it with dozing equipment being used in your division, and you'll see why major dirtmovers and industrial and railroad officials, like yourself, are adding modern Tournadozers to their equipment fleets.

For more information on these and other Tournadozer railroad applications, plus descriptive bulletin and owner-verified performance reports, write direct or contact your LeTourneau Distributor. He will be happy to help you without obligation.

Ask for bulletin TD-117

LETOURNEAU

R. G. LeTOURNEAU, INC.



Power for High Cycle Tools

Power for Standard Universal Tools

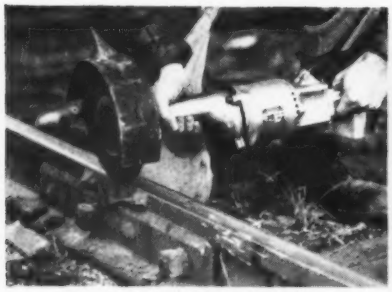
You Get BOTH from this

HOMELITE *Carryable* GENERATOR

It's called the Homelite "Dual Purpose" Generator . . . and dual purpose it is. You can use it to operate the newer, faster, more efficient high cycle tools. You can use it to operate your standard universal tools . . . or even floodlights for night emergency maintenance. Yes, and you can use it everywhere. Light weight and compact, it is easily and quickly put into operation any place.

With more and more high cycle tools being used for railroad maintenance, this Homelite Generator solves the power problem. It's the first carryable Generator of its kind developed and the finest, most dependable obtainable today. Ask for free demonstration.

Speeds Your Maintenance Work All Along the Line . . .



For operating high cycle grinders.

For operating high cycle wrenches.

For operating Homelite Electric Chain Saws.

Manufacturers of Homelite

Carryable Pumps · Generators

Blowers · Chain Saws

PERFORMANCE · DEPENDABILITY · SERVICE

HOMELITE

CORPORATION

204 RIVERDALE AVENUE • PORT CHESTER, N. Y.

For additional information, use postcard, pages 367-368

Use Low Volatile *Pittsburgh* BRUSH KILLER 22

Now you can clear your right-of-ways with minimum danger to valuable crops because Pittsburgh Brush Killer 22 contains the new low volatile ester, Tetrahydrofurfuryl (THFE*). Pittsburgh Brush Killer 22 *stays where you spray!* And this powerful brush killer will clear your right-of-ways faster and at far *lower cost* than hand methods. Drop us a line and we'll gladly send you detailed information about *Quality-Controlled* Pittsburgh Brush Killer 22.

* U. S. Patent Pending

PITTSBURGH AGRICULTURAL CHEMICAL COMPANY

EMPIRE STATE BUILDING, NEW YORK 1, NEW YORK

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Standard for Quality

ORGANIC INSECTICIDES: Benzene Hexachloride, Toxaphene, Dichloro Diphenyl Trichloroethane, Aldrin, Dieldrin, Chlordane. **ORGANIC PHOSPHATE INSECTICIDES:** Parathion Wettable Powders, Parathion Liquid Concentrate, Metacide. **WEED KILLERS:** 2,4-D Acid, 2,4-D Amine Concentrates, 2,4-D Ester Formulated Concentrates, 2,4-D Sodium Salt Monohydrate, 2,4,5-T Formulations. FUNGICIDES, SEED DISINFECTANTS, COTTON SPRAYS AND DUSTS, AND OTHER SPECIAL AGRICULTURAL CHEMICALS.

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A DIVISION OF
PITTSBURGH COKE & CHEMICAL CO.
Grant Building • Pittsburgh 19, Pa.

COAL CHEMICALS • AGRICULTURAL CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

A NEW AND IDEAL MEDIUM *for* PAVING STATION PLATFORMS

Economically!

THE JACKSON VIBRATORY COMPACTOR

THE ORIGINAL PLATFORM

WITH ROCK-FILL BASE BEING CONSOLIDATED BY THE JACKSON VIBRATORY COMPACTOR

This remarkably efficient and relatively low-cost outfit compacts rock fill and asphalt rapidly, with a thoroughness unsurpassed by larger much more expensive equipment, and it is far more mobile and convenient.

In spite of its small size, the compactor delivers up to 4500 1¾-ton blows per minute. It propels itself and ideally compacts 900 to 1200 sq. ft. per hour, closely approaching, in the case of asphalt, the theoretical density of the mix being used. It operates on 3-phase, 110 v., 60 cycle AC from a *Jackson power plant mounted on an auto trailer equipped for quickly picking up and lowering the compactor. (Skid mounting of power plant is optional.) Write for complete descriptive literature. Then try one. We believe you are bound to agree that it far surpasses all other equipment for rehabilitating station platforms ECONOMICALLY.

ALSO IDEAL FOR HIGHWAY CROSSINGS, BETWEEN RAILS IN CITY STREETS and COMPACTING GRANULAR SOILS IN CONCRETE FLOOR SUB-BASES, CLOSE TO ABUTMENTS, IN TRENCHES, etc.

THE FINISHED BLACK-TOP PLATFORM AS COMPACTED BY THE JACKSON

JACKSON VIBRATORS INC.
LUDINGTON MICHIGAN

*Power Plant generates both single and 3-phase, 110 volt, 60 cycle AC, and also may be used to operate other tools and lights

Complete
BRUSH and WEED KILLING SERVICE

PIONEER in the improved right-of-way brush control

Spraying equipment specifically designed and proven for the purpose

LEADER in effective grass and weed killing control

For Your Railroad . . .

- PROVEN CHEMICALS
- TRAINED PERSONNEL
- SPECIALIZED EQUIPMENT
- RECOGNIZED EXPERIENCE
- INSURED RESPONSIBILITY

Producing . . .

MAXIMUM VEGETATION CONTROL ECONOMICALLY THROUGH EFFICIENT OPERATION

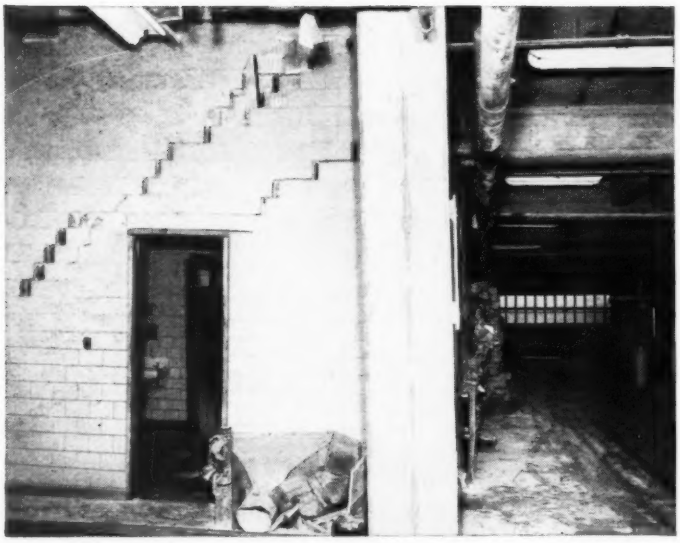
- TCA
- OILS
- 2, 4-D
- PENTACHLOROPHENOL
- BRUSH KILLERS

Spray Services Incorporated

Pioneers in Right-of-Way Spraying

P. O. BOX 5444 HUNTINGTON, W. VA.

Monotubes put "crippled" building back on its feet!



Severe cracking of building wall due to differential settlement.

DOING unusual foundation jobs, even with low headroom, is often the *usual* task for Monotube steel piles. For example, the building pictured here became badly cracked due to differential settlement. The condition had to be corrected—permanently!

Providing proper underpinning *and* licking the low headroom problem was easy with Monotube piles. Short, 6-foot lengths were driven easily; extensions were quickly weld-spliced as needed to reach good soil at 65 to 70 foot depths.

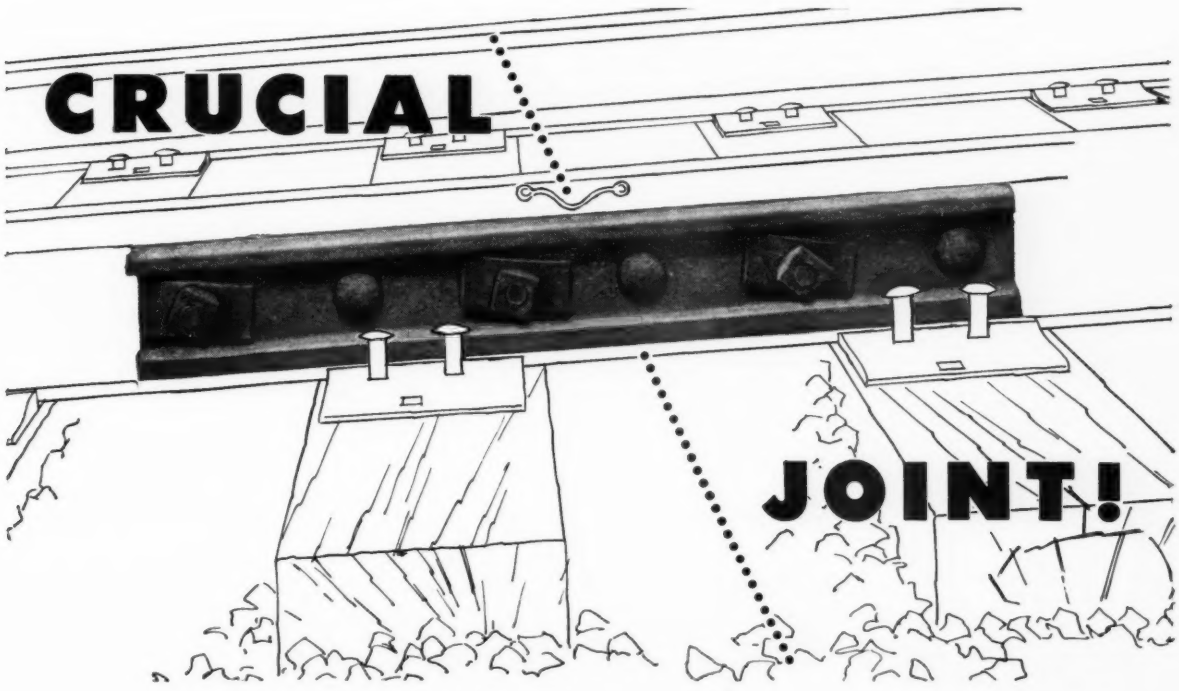
Monotubes have advantages that help solve problems in all kinds of foundation construction—from turnpikes, bridges and skyscrapers, to jobs like the one pictured here. Monotubes, cold-rolled for high strength, offer exceptional rigidity and high structural value. They come in lengths, gauges, tapers and sizes for varying soil conditions.

Send for the complete story. Find out how Monotube steel piles can simplify foundation work and cure construction "headaches", at minimum cost *and* in minimum time. Write to The Union Metal Manufacturing Company, Canton 5, Ohio.

Close-up of Monotube pile being driven in 6-foot sections. Installation by The Purdy Construction Company, Mansfield, Ohio.

UNION METAL

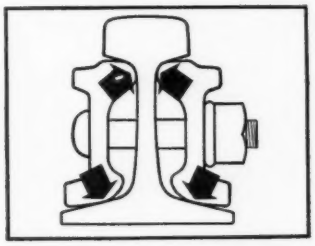
Monotube Foundation Piles



Protect rail joints with NO-OX-ID "A Special"

Every rail joint along the way is a crucial one. That's why it is so important that correct materials be selected to protect them.

NO-OX-ID "A Special" is a rust preventive particularly suited for this purpose. Its weathering properties insure a long service life, which, in turn, provides lubrication and protection to prevent freezing of the rail joint and minimize wearing of the joint bar. Easily and quickly applied, it meets all phases of the job condition. Straight, smooth track with the finest riding qualities is assured. Rail bonds, also, are best protected with NO-OX-ID "A Special."



NO-OX-ID "A SPECIAL" PREVENTS "FREEZING"

Arrows mark the fishing areas where non-oxidizing NO-OX-ID "A Special" prevents joint bars from freezing while protecting the metal against corrosion, resulting in added years of service.

WRITE FOR BULLETIN

Your copy of "How to Protect Rail Joints Using NO-OX-ID," including application methods, will be sent on request.

DEARBORN CHEMICAL COMPANY
Merchandise Mart Plaza • Chicago 54, Illinois

DEARBORN CHEMICAL COMPANY
Merchandise Mart Plaza, Dept. RE
Chicago 54, Ill.

☐ Have a Dearborn Sales Engineer call.

☐ Send "How to Protect Rail Joints Using NO-OX-ID".

Name.....

Position.....

Railroad.....

Address.....

City.....*State*.....

Dearborn
Reg. U. S. Pat. Off.

NO-OX-ID
IRON + OX = RUST

THE ORIGINAL RUST PREVENTIVE

Look in your own backyard!

Vital scrap lies in the oddest places . . . a morning's search can be a needed help.

Scrap is where you find it. Maybe not within the view of your boudoir window. But have you made a real check of your plant premises?

Frankly, all of us suffer from the same inertia and bad habits. We saw the papers and read of the constant cry for steel. We even read ads like these—made an instant promise to do something about it—and with our collective red face—forgot it.

But how about changing all that? How about this very morning—today at the very latest—joining us in a thorough search of the premises . . . and digging out that crumbling pile of iron oxide . . . the stuff you know you never will use in a thousand years . . . and get it on the way to the melting mills.

Costs come down under the Airco plan

Remember SCRAP FOR STEEL TODAY OR A SCRAP FOR LIFE TOMORROW!

AIRCO® **AIR REDUCTION**

AIR REDUCTION SALES COMPANY • AIR REDUCTION MAGNOLIA COMPANY • AIR REDUCTION PACIFIC COMPANY

REPRESENTED INTERNATIONALLY BY AIRCO COMPANY INTERNATIONAL

DIVISIONS OF AIR REDUCTION COMPANY, INCORPORATED

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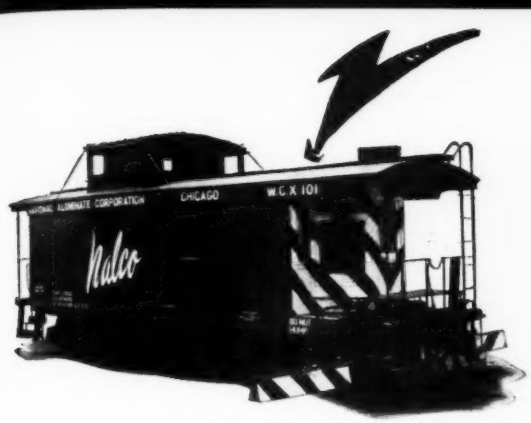
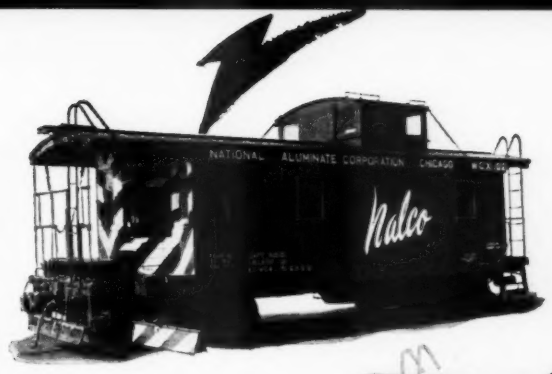




6 MORE REASONS for *Nalco*®

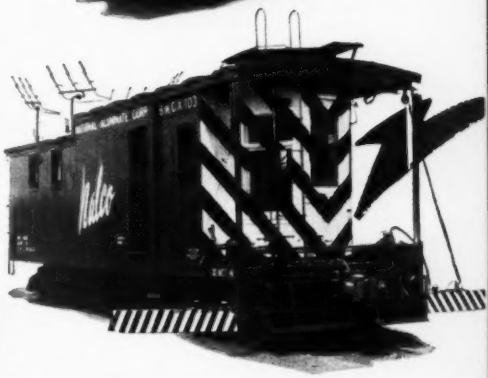
COMPLETE WEED and BRUSH CONTROL

Nalco Spray Cars, engineered to give precision chemical dosage and coverage, are added good reasons for using safe, powerful Nalco weed and brush control chemicals on your right-of-way.

Several Nalco formulas are available . . . specifics for grasses, weeds, annuals or perennials, and Nalco spray cars are equipped to spray two formulas simultaneously, when necessary, in correct proportions for effective control. Spray cars, each with precise metering and indicating equipment, are available without charge to railroads using Nalco weed control chemicals in tank car lots.

Write for data on spray car availability and Nalco chemicals to keep your right-of-way free of weeds and brush.

NATIONAL ALUMINATE CORPORATION
6191 West 66th Place • Chicago 38, Illinois
Canadian inquiries should be addressed to Alchem Limited, Burlington, Ontario



THE *Nalco* SYSTEM • **Serving Railroads through Practical Applied Science**

Six Nalco Spray Cars shown above have all gone into service within the past two years. Modern design, equipment and instrumentation assure maximum spraying control and labor-saving efficiency.

For additional information, use postcard, pages 367-368

"TIMKEN® bearings have unqualified approval for our cars," says Fairbanks-Morse

THIS model 53 Fairbanks-Morse motor car is light in weight—yet big enough to carry a full section gang and all their tools! To insure smooth performance and immediate availability, Fairbanks-Morse engineers have mounted the crankshaft and wheels on Timken® tapered roller bearings.

Fairbanks-Morse has been using Timken bearings on the crankshafts of their motor cars for more than 25 years. They report, "Timken bearings have unqualified approval for our cars".

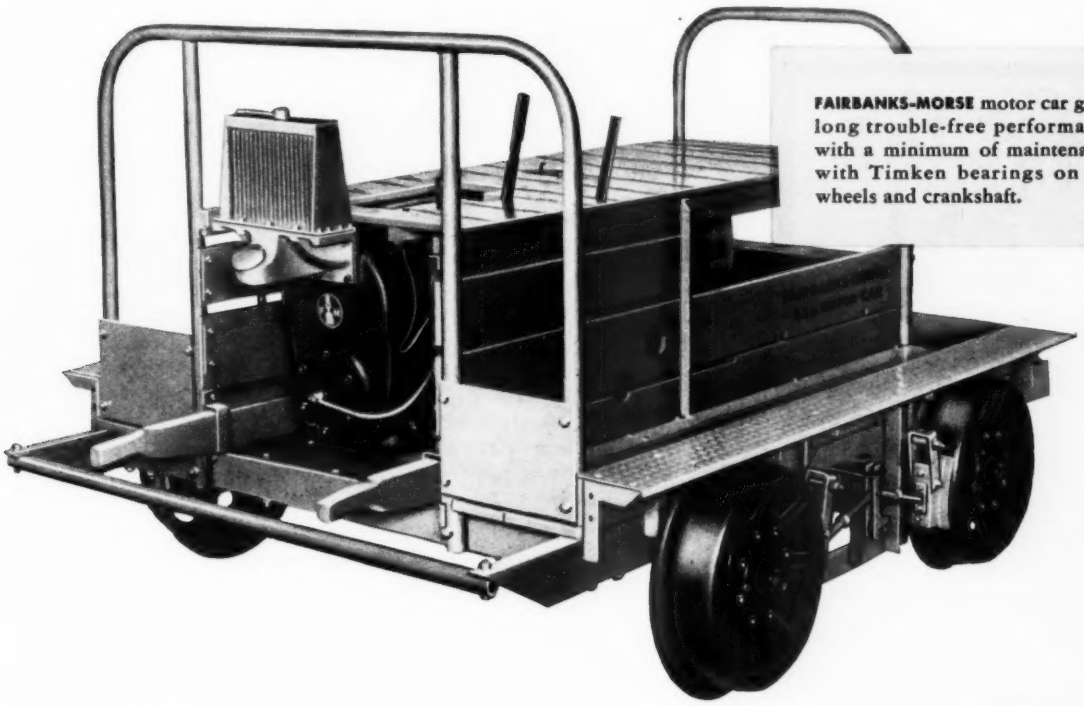
With Timken bearings, the crankshaft is held in rigid alignment. Wear on moving parts is reduced, end-play is eliminated. That's because the tapered construction of Timken bearings carries both radial and thrust loads in any combination.

Friction and wear in the car's wheels are reduced because Timken bearings have true rolling motion and incredibly smooth surface finish. Wheels roll smoothly. And wheel gauge is accurately maintained.

Line contact between the rollers and races of Timken bearings provides load capacity to spare. Because they hold shafts and housings concentric, closures are made more effective. Dirt, coal dust and moisture are kept out—lubricant in.

No other bearings give you all the advantages you get with Timken bearings. Specify them for the machinery you use and the machinery you buy. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



FAIRBANKS-MORSE motor car gives long trouble-free performance with a minimum of maintenance with Timken bearings on the wheels and crankshaft.

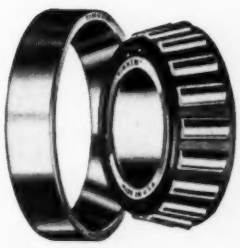
FINISHED TO CLOSER TOLERANCES

Finishing to incredible smoothness accounts for much of the precise, smooth rolling performance of Timken bearings. This honing operation is typical of the amazingly accurate manufacturing methods at the Timken Company.

The Timken Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

TIMKEN

TAPERED ROLLER BEARINGS



NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION

pick the brush Killer that's proved for the job!

When you pick a product for brush control, you can't afford to test 50 or more formulations to determine which one is best for the job. *But we did*—in cooperation with public utility companies, highway departments, railroads and spray service organizations. These tests on many species of brush in all sections of the country at all seasons of the year *proved* that Esteron* Brush Killer and Esteron 245 should be your first consideration in any successful brush control program. Here's why:

Both contain highly effective low volatility propylene glycol butyl ether esters which have been proved by actual use over thousands of miles of right-of-ways. Esteron Brush Killer, a mixture of the 2,4-D and 2,4,5-T esters, is widely used for control of mixed stands of brush. For certain resistant species that need a straight dose of 2,4,5-T—Esteron 245 is the ticket! It is successful also for year-around basal bark and stump treatment.

Both products have excellent storage qualities.

Yes, good results depend on the brush killer you use and how you use it. Pick the one that's *proved* for the job! You are invited to call on Dow sales and technical men for consultation on your brush control problems.

*ESTERON is a registered trade mark of The Dow Chemical Company, largest producers of weed, brush and grass control chemicals.

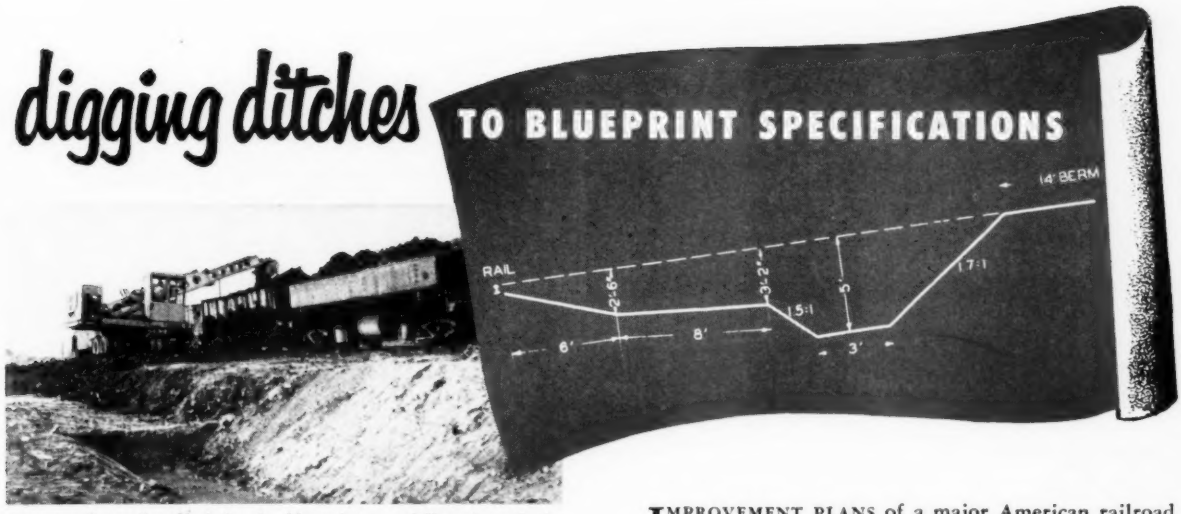
ESTERON BRUSH KILLER
and ESTERON 245
CONTAINING NEW LOW-VOLATILITY ESTERS

THE DOW CHEMICAL COMPANY
Agricultural Chemical Department • Midland, Michigan
New York • Boston • Philadelphia • Atlanta • Cleveland • Detroit • Chicago
St. Louis • Houston • San Francisco • Los Angeles • Seattle
Dow Chemical of Canada, Limited, Toronto, Canada

DOW
CHEMICALS
INDISPENSABLE TO INDUSTRY AND AGRICULTURE

For additional information, use postcard, pages 367-368

digging ditches TO BLUEPRINT SPECIFICATIONS



Exacting "specs" called for by blueprint are followed easily by operator with Gradall hydraulic "Arm-Action".

With ½-yard ditching bucket Gradall moves and loads at rate of 40 cubic yards per hour. Note clean precision.

Full 360° swing lets Gradall boom extend easily to dump spoil into waiting gondolas.

Gradall's compact design is ideal for working under low wires, around track-side obstacles.

IMPROVEMENT PLANS of a major American railroad called for extensive construction of ditches along the right of way. And long experience had given this railroad definite ideas on how they wanted them made.

Because of special contours that had to conform to accurate measurements, Gradall was picked to do the job.

No time was lost changing to other types of machines, and costly clean-up hand labor was eliminated.

Gradall is the Only Machine that can do the Whole Job in One Operation!

Railroad officials and the contractor alike are enthused over Gradall's clean, finished work—exactly to "specs".

Further, Gradall travels from site to site in truck time, negotiating crowded yards, low bridges and narrow roads with ease. All kinds of standard and special tools can be easily interchanged in a matter of minutes—enabling Gradall to do many other jobs, including: widening cuts and fills; trenching; setting pipes and forms; excavating; restoring embankments; ripping and loading old pavement; ditch cleaning; sloping and grading; backfilling and loading.

Gradall Eliminates Hand Labor . . . Does More Jobs Better and at Lower Cost!

Gradall®

DIVISION OF **WARNER & SWASEY** *Cleveland*

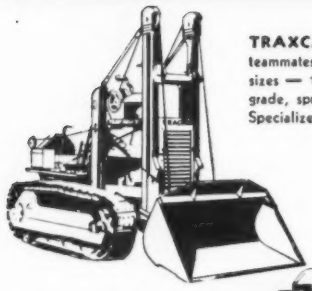
Gradall Distributors in 60 principal cities in the United States and Canada

GRADALL—THE *Multi-Purpose* MACHINE FOR OFF-TRACK MAINTENANCE

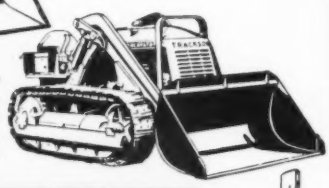
TRACKSON

OFF-TRACK EQUIPMENT FOR ON-TRACK PROFITS

Versatile, world-proved TRACKSON Tractor Equipment teams with dependable "Caterpillar" Diesel Tractors to do a wide variety of off-track construction and maintenance work . . . to handle all types of materials . . . to turn in big savings on every task they do.



TRAXCAVATORS — famed tractor-shovel teammates of "Caterpillar" Diesel Tractors. Four sizes — 1/2 to 4 cubic yard capacities. Dig, grade, spread, fill, load carry, lift, stockpile. Specialized attachments available.

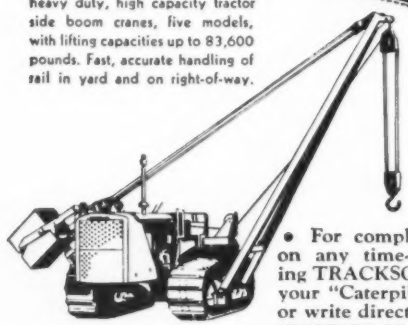


HYDRAULIC TRAXCAVATOR — fast, powerful digging, loading, carrying unit — where headroom is at a minimum. Job-multiplying attachments available.

The long-lived TRACKSON tools multiply manpower efficiency to get jobs done on schedule without interruption of traffic. Depend on economical TRACKSON equipment to carry you through heavy construction and maintenance schedules!

TRACKSON EARTH AUGERS — bore holes at any usable angle; for telegraph and telephone poles, signal tower footings, anchor holes, etc., sets poles with ease. Winch included.

TRACKSON PIPE LAYERS — heavy duty, high capacity tractor side boom cranes, five models, with lifting capacities up to 83,600 pounds. Fast, accurate handling of rail in yard and on right-of-way.



TRACKSON

- ANGLEFILLERS
- TRACLOADERS
- LIFT FORK
- LAND CLEARING EQUIPMENT
- ANGLEGRADERS
- DOZER BLADES

• For complete information on any time-and-money saving TRACKSON machine, see your "Caterpillar" Dealer . . . or write direct.

TRACKSON CO., Milwaukee 1, Wis.
A Subsidiary of Caterpillar Tractor Co.

TRACKSON

TRAXCAVATORS
TRACLOADERS
PIPE LAYERS
EARTH AUGERS

Better Weed Control

HYKIL

TRACK TREATMENT PROGRAM

Best approach to weed control problems. The HYKIL track-treatment program offers an outstanding new concept of economical weed and brush control . . . proven by thousands of miles of superior performance.

The high-potency #6 concentrate of specially refined petroleum compounds gives non-poisonous, faster, longer-lasting kill. Immediately controls existing weeds and grass growth, penetrates and sterilizes exposed weed seeds, but will not affect adjacent vegetation. Adopted by major railroads as standard weed control material. Stocks available from Tulsa, Oklahoma, Portland, Oregon, and Los Angeles, California.

HYKIL "200" Spraycars are expressly designed...the latest in railroad weed killer application equipment. Operating at 10-15 mph, applying up to 1500 mixture gallons per mile, HYKIL cars give positive weed coverage of weeds and grasses at variable desired widths to 24 feet. Draws HYKIL Weed Oil and water from separate, attached tank cars, metering amounts and mixing within pump at exact moment of application. Treats 40-60 track miles daily.

For positive results - Use the TWO!

HYKIL Weed Killer #6
HYKIL "200" Spraycars

Write for complete literature and information.

W. T. COX COMPANY
1021 Fruit St., Santa Ana, Calif.
and Kansas City, Missouri

HYKIL
RAILROAD DIVISION

For additional information, use postcard, pages 367-368

No More *Trenching!*
No More *Jacking up Track!*

This WOOLERY
Tie-removing Team Now Eliminates This Slow, Costly Method!

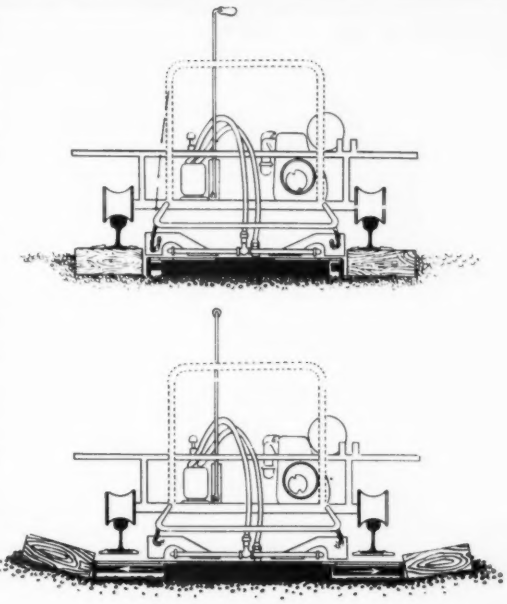
Use the WOOLERY TIE-END REMOVER in conjunction with the improved model NU WOOLERY TIE CUTTER! It's the *perfect team* for greater savings on tie renewals—and gives *smoother, safer track, too!*

The trend toward heavier rail and double shoulder tie plates has made removing tie-ends increasingly difficult. With the WOOLERY Tie-end Remover, this task can now be done *in less than a minute by one man with no more effort than that required to turn a valve!* See how simply and efficiently this WOOLERY team works—follow the "1-2-3-" steps of tie-removal.

1. After the tie has been cut on both sides by the WOOLERY Tie Cutter, the operator of the Tie-end Remover—(who follows closely behind so that operators can assist each other in removing machines from track)—lifts the center section out with tie tongs.

2. A double-ended hydraulic cylinder is then lowered into the tie bed.

3. A simple turn of the valve moves these two pistons outward, *pushing the tie-ends completely clear of the rail—whether working with single or double shoulder tie plates!* The crib is now open—and only the necessary amount of ballast is removed to admit the new tie.



There has been no trenching or jacking up of track—thus line and surface of track are maintained, soft spots and humpy track are eliminated—the new tie rests on a firm bed and little or no tamping is necessary!

SINCE 1917 RAILWAY MAINTENANCE EQUIPMENT

Woolery MACHINE COMPANY

2919 COMO AVE. S. E. MINNEAPOLIS 14, MINN.

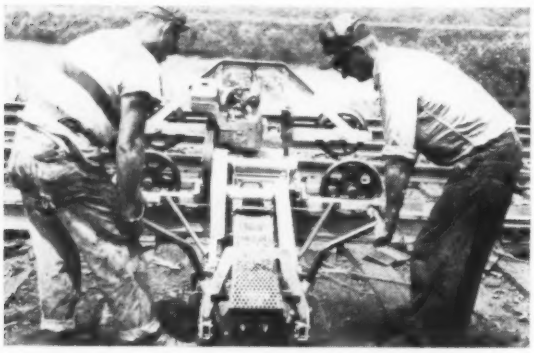
Exclusive Export Representatives

PRESSED STEEL CAR CO., NEW YORK, N. Y.

SPECIFICATIONS

- ENGINE Wisconsin air-cooled 4-6 H.P.
- PUMP 1,500 P.S.I. built-in relief valve, 1 gal. reservoir.
- DRIVE Double V-belt.
- CYLINDER 3" bore, honed finish, double-ended, double-acting. Hardened, ground and chrome plated rams equipped with rod wipers.
- TRACK ROLLERS 6" self-centering, insulated.
- NET WEIGHT 360 pounds.
- CRATED WEIGHT 490 pounds.

A **BETTER** *way to CLEAN CRIBS . . .*



NEW RTW P-46 BALLAST EXTRUDER

For lowering ballast in cribs before adzing ties, this new RTW machine embodies design and operating features that help speed rail replacement jobs and keep down costs. Rugged teeth mounted on an engine-driven endless chain speedily remove ballast to intertrack spaces or to shoulders without damaging ties. Cribs are cleaned to a uniform level, thus avoiding formation of water pockets.

Simple, compact design makes the RTW P-46 Extruder easy to move along track to and from location. A counterbalancing feature minimizes effort required by operator to raise and lower operating head while machine is in use.

Be sure to call or write immediately for full description and prices on this time- and cost-saving unit.

Railway Trackwork Co.

3207 KENSINGTON AVE., PHILADELPHIA 34, PA.

Distributors for

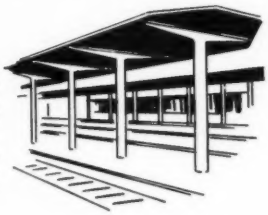
Burro Cranes
Dapco Sprayers
LeRoi Air Compressors
McCulloch Chain Saws
THOR Electric Tools
Wayer Impactors

6030

Sonotubes®

PAT. APP. FOR

SAVE MONEY



UMBRELLA SHED SUPPORTS • Now you can economically pour reinforced round concrete columns in position, on the job, to form umbrella supports of lasting permanence, in a fraction of the time and cost required to build conventional forms.

CULVERTS • No joints to open or break when Sonotubes are used in forming solid one piece concrete culverts.

Easy to handle, easy to store, cut to lengths on the job, Sonotubes have wide applications in railroad construction and maintenance. In sizes 3" to 24" I. D., lengths up to 25'

Write for complete information.

SONOCO PRODUCTS COMPANY
Hartsville, S. C. Mystic, Conn.

sonoco
PAPER CARRIERS
REG. U.S. PAT. OFF.

SPEED RAIL WORK
WITH NO INTERRUPTION OF SERVICE

ON

Lining crossings, switches.
Renewing insulated joints, end posts.
Pushing, pulling continuous rail.
Controlling expansion.

Simplex No. 550 RAIL PULLER AND EXPANDER

Works on outside of rail—Operated by one man to replace rail pounding crew—Eliminates battered rail ends, bolts, crossings.

Simplex No. 550 (25 tons capacity) Rail Puller and Expander has alloy steel, heat treated U-Bar to stiffen the joint. Lever socket "locks down;" nothing protrudes above rail. The U-Bar fits all rails measuring 3¼" or more from under ball of rail to flange at top of web—special bars available for smaller rail.

A time-saving, work-speeding tool to improve maintenance efficiency. Also available in 30-ton capacity. Write for specifications and prices.

Simplex
LEVER · SCREW · HYDRAULIC
Jacks

TEMPLETON, KENLY & CO.
1026 South Central Avenue
Chicago 44, Illinois

TIE LIFE LENGTHENED
with Koppers Tie-Sealing Compound

THESE 14-FOOT BRIDGE TIES are in danger. Unless splits and cracks shown here are retarded, they will get progressively worse. The heart of the ties will be exposed to decay, and tie failure will eventually result. Replacement of these ties would, of course, be expensive.

KOPPERS TIE-SEALING COMPOUND, a specially-processed coal-tar coating, was applied by brush. Cracks were filled and sealed with this water-resistant coating. Tie replacement will be deferred an estimated 5 to 10 years. Maintenance is also reduced. The fine stone cover is an armor against fire.

KOPPERS

Use Tie-Sealing Compound on your railroad system. Details and price information on request.

KOPPERS COMPANY, INC., Tar Products Division, Pittsburgh 19, Pa.

Lewis sealtite hook bolt

A highly dependable, superior bolt used in bridge and trestle construction. Forged from S.A.E. 1045 steel. Patented fins prevent turning. Sealtite washer nut adds strength, stops seepage. *Available in Hot-Dip Galvanized finish for greater durability and economy.*

Also available with std. sq. and hex. nuts.

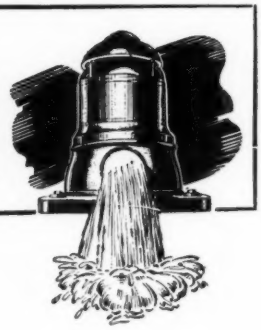
Used by 85% of America's Class I Railroads.

See your Lewis representative, or contact factory for samples, prices, full details.

Lewis BOLT & NUT COMPANY
504 Malcolm Ave. S. E.
MINNEAPOLIS 14, MINNESOTA

LOOK FOR THIS STAMP OF U QUALITY

WATER



FROM THE GROUND BELOW YOU

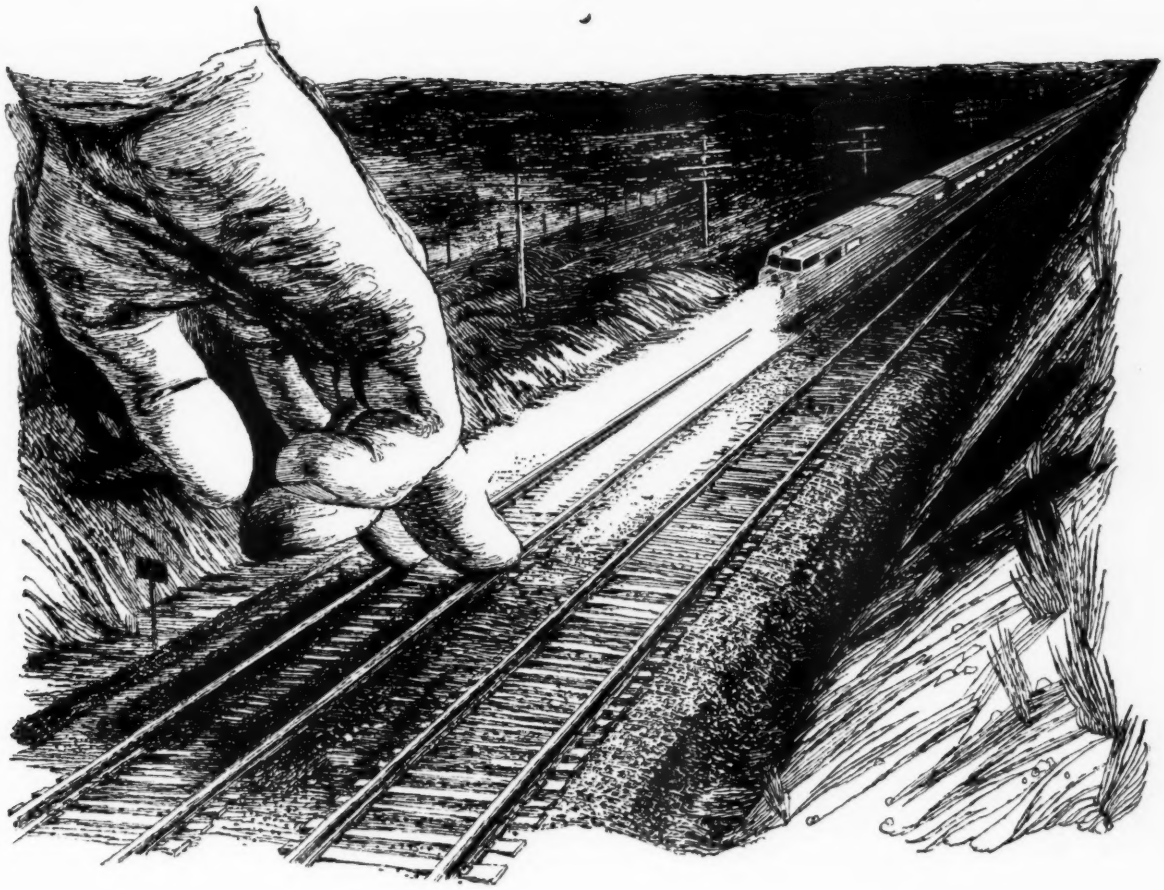
IN single or multiple units, Layne well and pump installations produce tremendous quantities of water at extra low cost. High efficiency designing, precision building and advanced methods of installation make Layne wells and pumps a highly practical and fully justified investment. Layne does the job complete; drills the wells, furnishes all casing, shafting, pumps, motors and sand screen. After complete testing, the system is delivered to you in perfect operating order.

For further information, catalogs and engineering data, address

LAYNE & BOWLER, INC.
General Offices, Memphis 8, Tenn.

Layne **WATER SUPPLY WELLS & PUMPS**

For additional information, use postcard, pages 367-368



Clearing the track of clickety-clack

You ride in comfort on longer-lasting rails because the song of the track is being stilled

Like the paddleboat whistle on the river, the clickety-clack of wheels on rails is on its way to becoming a memory.

This familiar clatter and chatter has been like music to some of us when we travel. But it's been a headache to others . . . particularly our railroads.

Wheels pounding on rail joints cause jolting and wear as well as noise. And wear means expensive repair or replacement of rails and the bars that connect them.

ELIMINATING RAIL JOINTS—"Ribbonrail" is becoming important news because it provides a way to solve the high cost of joint maintenance by eliminating the joints themselves.

RAILS BY THE MILE—"Ribbonrail" is formed by welding the rails together under pressure in the controlled heat of oxy-acetylene flames. The welding is done on the job before the rails are laid . . . and they become continuous ribbons of steel up to a mile or more in length.

Mile-long lengths of rail in use may seem impossible because of expansion and contraction under extreme changes in weather and temperature. "Ribbonrail" engineering has solved this problem . . . reduced rail maintenance cost, and created the comfort of a smoother, quieter ride.

A UCC DEVELOPMENT—"Ribbonrail" is a development of the people of Union Carbide. It is another in the long list of achievements they have made during 40 years of service to the railroads of America.

FREE: *If you would like to know more about "Ribbonrail," send for the illustrated booklets "Continuous Rail—A Challenge to the Engineer," and "90 Miles of Continuous Welded Rail." Ask for booklets B3 and B4.*

UNION CARBIDE
AND CARBON CORPORATION
30 EAST 42ND STREET UCC NEW YORK 17, N. Y.

UCC's Trade-marked Products of Alloys, Carbons, Chemicals, Gases, and Plastics include

PREST-O-LITE Acetylene • LINDE Oxygen • PRESTONE and TREK Anti-Freezes • BAKELITE, KRENE, and VINYLITE Plastics • SYNTHETIC ORGANIC CHEMICALS NATIONAL Carbons • ACHESON Electrodes • PYROFAX Gas • HAYNES STELLITE Alloys • ELECTROMET Alloys and Metals • EVEREADY Flashlights and Batteries

Here's the NEW NORDBERG

"GANDY"

...Another NORDBERG FIRST

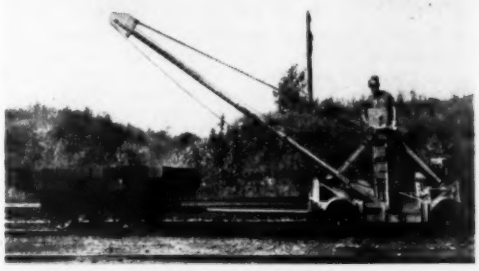
THE GANDY—Nordberg's latest development for better, faster maintenance at lower cost—is a triple-purpose machine: (1) TIE PULLER; (2) TIE INSERTER; and (3) MATERIAL HANDLING CRANE. The Gandy is designed to perform these functions primarily in connection with out-of-face raising and tie renewal. It is used to pull out old ties, pull in new ties, pile or load old ties, set machines on or off the track,* and distribute new ties, including hauling them to the work location. Two men operate the Gandy which because of its "mechanical muscles", removes the physical labor from each job and makes possible uniform production all day long.

The Gandy is a welded structural frame mounted on four 16" flanged wheels. A 5 HP air cooled gasoline engine with hydraulic coupling drives the propulsion mechanism and a winch. The Gandy is self propelled in either direction at speeds up to 12 miles an hour. The frame carries a 17 ft. telescoping boom which is raised or lowered mechanically and swung manually in a 180° arc from a position over the center of the track in front, around to a position over the center of the track in the rear of the machine.

* (For loads of 1000 to 2000 pounds, the Gandy is clamped to the track with a unique, positive acting Lever-Setoff Roller-Clamp device.)

FOR PULLING TIES

FOR INSERTING TIES



FOR MATERIAL HANDLING

For further details, write for Bulletin 201.

SPECIFICATIONS:

Weight—2300 lbs.
Boom length fully extended—17 ft.
Boom length fully telescoped—10 ft. 4 in.
Carrying capacity, full boom, no counterweight —400 lbs.
Carrying capacity, short boom and counterweight —1000 lbs.
Lifting capacity clamped to track—2000 lbs.

Use NORDBERG *"Mechanical Muscles"* to do a Better, Faster Maintenance Job at Lower Cost...

R552

ADZING MACHINE • CRIBEX • BALLASTEX • SCREENEX • GANDY • POWER JACK
POWER WRENCH • RAIL DRILL • RAIL GRINDERS • SPIKE PULLER • TRAKGAGER
TRACK SHIFTER • YARD CLEANER

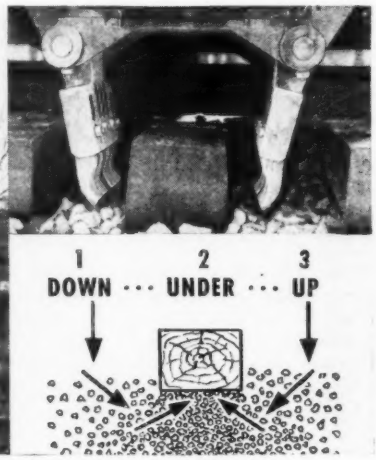
NORDBERG MFG. CO., *Milwaukee, Wis.*

NORDBERG MACHINERY

Continuous operation, during the entire work season for fourteen Power Ballasters. That was the report made by Northern Pacific's maintenance engineers. Their fifteenth Power Ballaster was out of service for only one day during that period.

Power Ballasters are built by Pullman-Standard to stand up, on the job, day after day. Maintenance is cut to minimum time out for minor repairs on location. And they keep producing through a long life span.

The unit shown above is working on the Northern Pacific at milepost 72 near St. Cloud, Minn. It is tamping a 0″ to 8″ lift on westbound track to make a run-off both ways from a crossover switch. The rail is 112lb. 1940 and the ballast is St. Cloud crushed granite averaging 2″ in size.



Easy, economical operation results from many exclusive features. The Power Ballaster is completely self-propelled; has a running speed of 25 m.p.h.; and has a self-powered set-off mechanism which enables four men to set the unit off laterally in 3 to 5 minutes. Delays due to train interruptions are therefore reduced to a minimum. The Ballaster's high production rate makes maximum use of available track time.

Simple, two-lever control permits operator to keep work moving smoothly, rapidly, efficiently. Automatic controls assure uniformity.

Meets A.R.E.A. specifications. Because the Power Ballaster has 32 tamping bar positions and five different sizes of quickly interchangeable tamping bars, the Power Ballaster: (a) is a universal machine, (b) produces a "squared" under tie-and-rail area of ballast compaction fully meeting A.R.E.A. specifications, and uses the production tamping methods specified by the A.R.E.A. *Lower Right:* Diagram shows triple-action compaction.

W. W. JUDSON, *Vice President,* Operation and Maintenance of the Northern Pacific, tells about the performance of their 15 Pullman-Standard Power Ballasters, during *four* work seasons. (*see next page*)

SUBSIDIARY OF

PULLMAN

ROAD & TRACK EQUIPMENT DIVISION

BIRMINGHAM • CLEVELAND • PITTSBURGH • NEW YORK • WASHINGTON • SAN FRANCISCO • **79 EAST ADAMS STREET**

Pullman-Standard POWER BALLASTERS

The dependable, "ready-to-work" characteristic of the Power Ballaster is recognized as an important feature by many track maintenance engineers. These tampers are ruggedly built to stay with the job. Yet are designed to facilitate minor repairs or adjustments on location by the Ballaster operator. A Pullman-Standard course for teaching the railroad's own personnel efficient maintenance and power tamping procedures also helps assure maximum output, minimum delay.

on the Northern Pacific prove

The complete dependability of the Power Ballaster is further assured by factory field service men and stand-by spare parts stocks—ready to meet any emergency, anywhere. Operating performance, under all ballast and raise conditions, is field-studied each work season by Pullman-Standard's engineers. Thus, even further improvements in the Power Ballaster's design are developed and new labor-reducing gang line-ups are determined.

high availability, low maintenance

That's why the Power Ballaster has the highest established equipment availability, the lowest maintenance and labor requirements and the highest production rate of any production tamper available today.

You can prove, while tamping your own ballast, the time- and money-saving advantages of the Power Ballaster. Choose one of these four ways: (1) outright purchase; (2) rental for 90 days, with option to buy; (3) straight rental for a minimum period of three months; (4) deferred quarterly payments over a period of 1 to 3 years. The rentals and deferred payments are established at substantially less than the realizable savings accruing during the payment periods.

NORTHERN PACIFIC

"The Northern Pacific has had *fifteen* of the first postwar built Pullman-Standard Power Ballasters in regular operation for four work seasons. Quality of work being done by these units is impressive, but equally important, our experience with these 15 Power Ballasters prove their reliability.

During the last work season, available production time lost due to mechanical delays was at a bare minimum and at no time was it necessary to call for factory service.

One reason for this good record is that the Power Ballaster is engineered in such a way that all moving parts are readily accessible for routine maintenance."

Here's what YOU can expect from the POWER BALLASTER:

- Longer Lasting Track
- More Production—Lower Labor Requirement
- Long Equipment Life
- Maximum Use of Track Time
- Easy Operation and Maintenance
- Universal Application—Versatile Production

Your Assurance: PULLMAN-STANDARD has been one of the great U.S. railroad equipment suppliers for 73 years; its time proven integrity and reliability are behind the POWER BALLASTER to protect your equipment investment and to assure a factory stand-by of spare parts and continuing factory service.

Write for booklet containing complete detailed engineering data and operating facts about the POWER BALLASTER

PULLMAN INC.

PULLMAN-STANDARD CAR MANUFACTURING COMPANY

CHICAGO 3, ILL. • CANADA: THE HOLDEN CO., LTD., MONTREAL • TORONTO • WINNIPEG • VANCOUVER

FOR SAFETY

101 ALL NEW INSPECTION CAR

+ *Immediate Reverse*
+ *Wheel Silencers*
+ *Low Lifting Weight*

THIS IS THE CAR WITH MORE SAFETY FEATURES!

More safety makes for more efficiency with the new Model 101 inspection car. With its simple friction drive transmission—four speeds forward, three reverse—it's a pleasure to operate. Low center of gravity helps it hug the rails. Full-vision cab* means more comfort, too. Rear lifting weight is only 98 pounds. All in all, the 101 is a 4-man car that should be investigated by every railroad. See your Fairbanks-Morse representative or write Fairbanks, Morse & Co., Chicago 5, Ill.

*Also available without cab.

FAIRBANKS-MORSE,

a name worth remembering

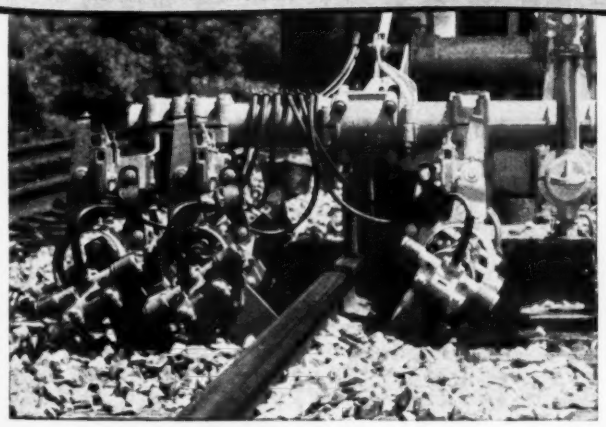
RAILROAD EQUIPMENT • RAIL CARS • PUMPS • SCALES • ELECTRICAL MACHINERY
DIESEL AND DUAL FUEL ENGINES • DIESEL LOCOMOTIVES • MAGNETOS

NO OTHER "MULTIPLE" MATCHES THE *Versatility* OF THE JACKSON!

Effortless, rapid and exact hydraulic indexing from tie to tie is furnished at the turn of a control in the 1952 JACKSON.

- ✔ It is the ONLY power tamper that OPERATES WITH EQUAL EFFICIENCY IN ANY PRACTICABLE LIFT OF TRACK and IN ANY TYPE OF BALLAST,
- ✔ THAT IS AS PRACTICAL FOR USE IN REGULAR OUT-OF-FACE SURFACING AS IN MAKING NEW BALLAST INSERTIONS,
- ✔ THAT PROVIDES QUICKLY INTERCHANGEABLE BLADES AND QUICK ADJUSTMENT OF THE ENTIRE MACHINE SO THAT GREATEST EFFICIENCY IS ACHIEVED UNDER ALL CONDITIONS.
- ✔ IT IS THE ONLY POWER TAMPER IN WHICH THE TAMPING BLADES CAN BE DIRECTED TO PENETRATE TO, AND ACTUALLY TAMP THE *VITAL SPOT* — THE LOAD-BEARING ZONE, directly beneath the rail.
- ✔ And its powerful vibratory action coupled with the right amount of pressure, as exerted by the weight of the tamping crosshead, consolidates the ballast uniformly and thoroughly.

With a JACKSON Multiple on your track (available on a down-to-earth basis, if desired) we believe you will agree it will do a better, faster job with less men and at less cost than any other equipment available. Let us discuss it with you.



Note how the tamper blades are directed right beneath the tie and rail.

MFD. BY
JACKSON
VIBRATORS
INC.
LUDINGTON, MICH.

SOLD IN U.S.A. BY
ELECTRIC TAMPER
& EQUIPMENT COMPANY
LUDINGTON, MICHIGAN

Just Published! HANDBOOK OF AMERICAN RAILROADS

Bringing You the Latest Available Facts and Figures with Photos and Maps of Every Class I U.S. Railroad

How many diesels has the Burlington Lines? What is the weight of rail in the main tracks of the Lehigh Valley? What were the A&B expenditures of the Atlantic Coast Line in 1950? What was the total operating revenue of the Sacramento Northern in 1949 and 1950? *Handbook of American Railroads* gives you these and thousands of other answers—quickly, conveniently, accurately—for only $2.95.

Now—for the first time—one handy volume enables you to sift facts and compare operations of every major railroad in the United States. Under one cover *Handbook of American Railroads* brings you the latest available (1949 and 1950) official facts and statistics on 127 Class I railroads.

This valuable reference book includes the number of diesel and steam locomotives, number and types of cars, weights of rail in main tracks, expenditures for A&B, financial and operating statistics, biographical sketches of the chief officers, and much other useful information. Specially-drawn maps show the route of each road. Interesting photographs of trains such as Olympian Hiawatha, The Red River, Twin Cities Zephyr and other rolling stock fill the book. A history of each railroad, highlighting information that is prominent or of unusual interest, accompanies the maps and photographs.

You'll find a thousand uses for *Handbook of American Railroads*. Only $2.95 for 256 5½x8½-inch pages packed with facts. To get yours at once, fill in and mail the Free Trial Coupon at right.

FOR EACH OF 127 RAILROADS THIS HANDY NEW BOOK GIVES:

1. Latest Equipment Data
2. Latest Financial and Operating Statistics
3. Historical Sketch of Road
4. Brief Biography of Chief Officer
5. Outline Map of Road
6. Photograph of Rolling Stock
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8. Many Other Highly Interesting Statistics and Facts Collected Here for the First Time

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Send me at once for Free Examination ..... copy (copies) of HANDBOOK OF AMERICAN RAILROADS at $2.95 each. If I am not completely satisfied, I will return the book(s) within 5 days of receipt. Or, I will keep the book(s) and remit the price plus a few cents additional for postage and handling.

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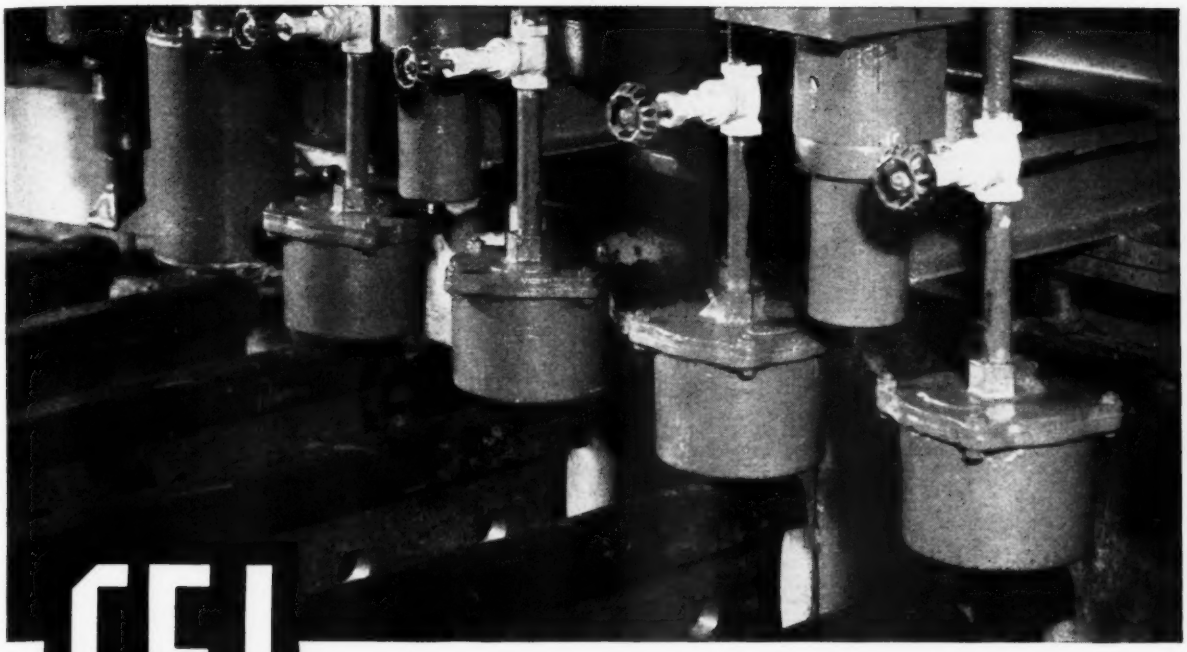
☐ **DISCOUNTS FOR QUANTITY ORDERS**—Check the box at left if you would like to receive information about company discounts on quantity orders for HANDBOOK OF AMERICAN RAILROADS. REM-4-52

For additional information, use postcard, pages 367-368



CF&I

END-HARDENED RAILS *for Western Roads*

ELIMINATE: Guesswork in Field Hardening
Haphazard Rail End Patterns
Damaging of Rail Ends before End-Hardening

WHILE GAINING: Uniformly End-Hardened Rail
Proper Location and Hardness of Treated Zone
Lengthening of Rail Life

CF&I RAILS & FASTENINGS

THE COLORADO FUEL AND IRON CORPORATION

DENVER, COLORADO

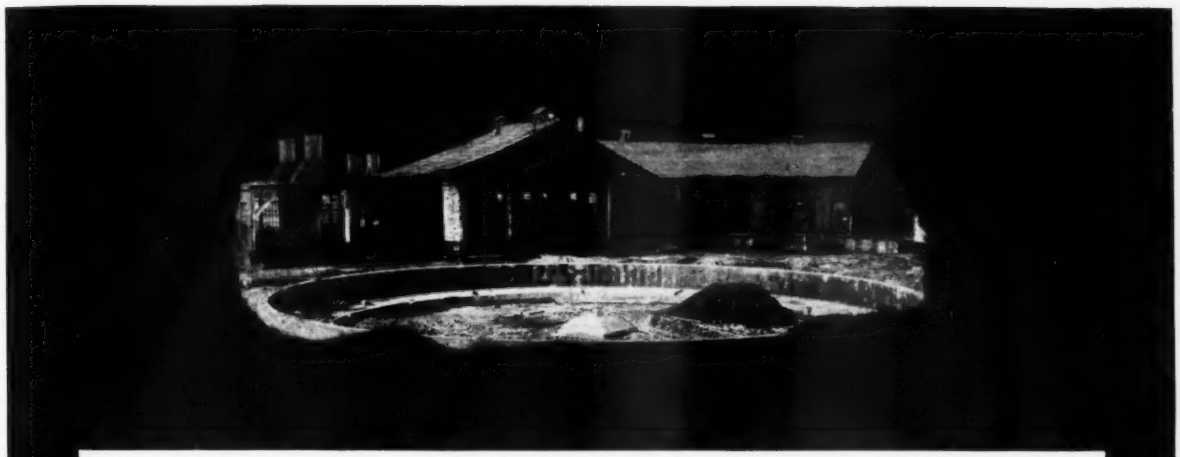
CF&I

ADDITIONAL INFORMATION

On Any of the Products Mentioned in This Issue

Below is a complete index of the products referred to in both the editorial and advertising pages of this issue. If you desire additional information on any of them, use one of the accompanying addressed and stamped postcards in requesting it. In each case give name of product and page number. The information will come to you directly from the manufacturer involved, without any obligation on your part.

Products Index



One of the 160 Uses of CONCRETE on Railroads

NO. 6 OF A SERIES

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Concrete engine terminals are just one of the more than 160 uses for concrete which enable American railroads to improve service and save time and money. The moderate first cost of concrete, its long life and low maintenance cost, result in ***low-annual-cost*** service, saving money for other budget items.

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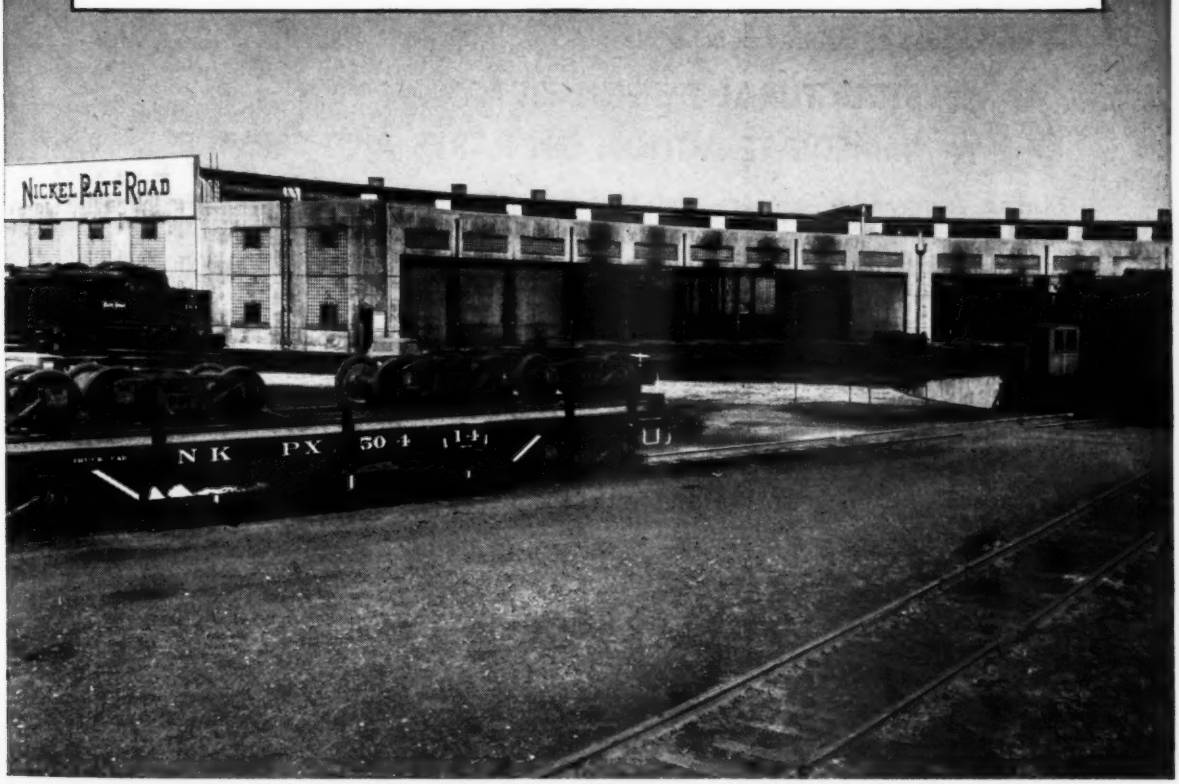
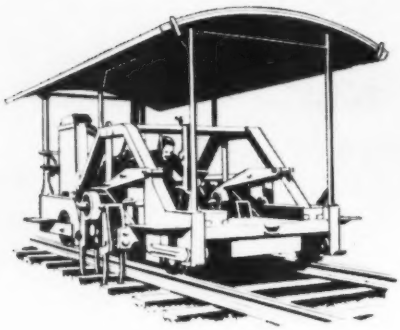
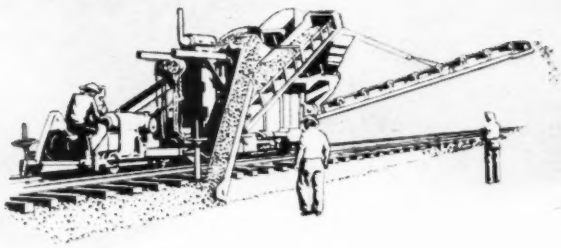


Keep Ahead of Trackwork Schedules





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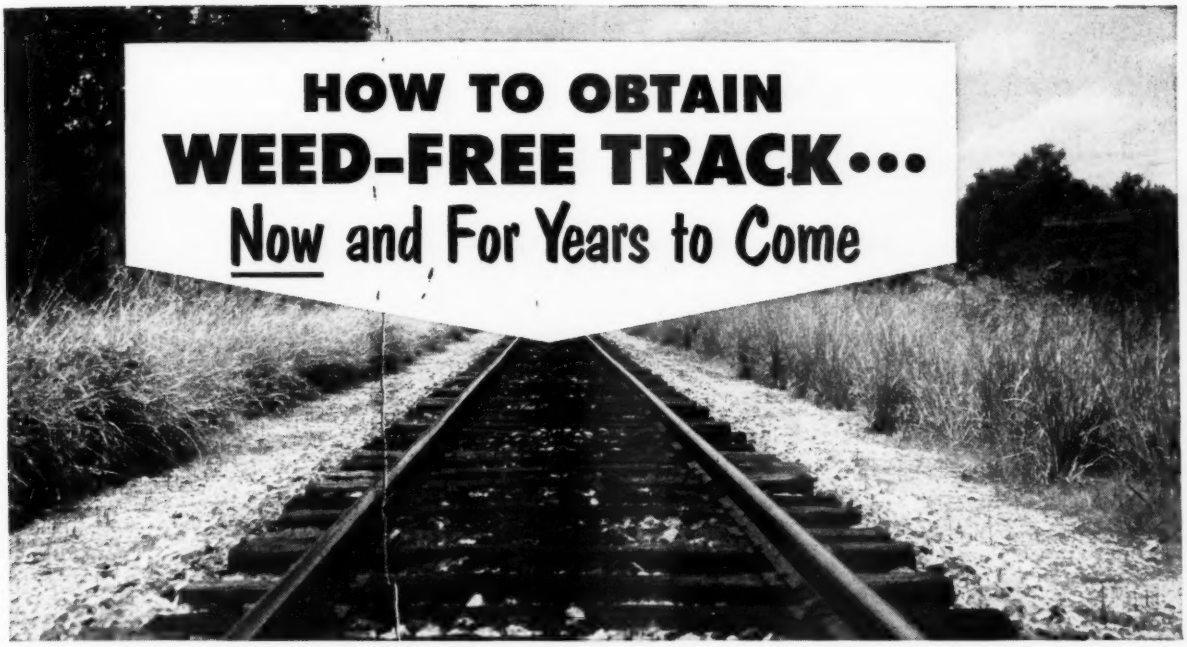
ALL OVER THE WORLD *Matisa* TRACKWORK SPECIALISTS



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gives You √ LONG-LASTING RESULTS √ LONG-RANGE ECONOMY!

No one herbicide can be a "cure-all" for the widely varying weed problems encountered by railroads from coast-to-coast.

That's why General Chemical has developed its "Custom Service" railroad weed control program...the only method that assures weed-free track immediately...with continuous reduction in re-growth coupled with long-range economy.

General's made-to-order method is patterned to fit the particular weed problems of *your* road. Treatment is carried on under the supervision of General Chemical's weed control specialists employing modern organic herbicides which thousands of miles of track treatment have proven most effective under specific vegetative and climatic conditions.

Aimed at control of perennial root systems, this scientific method kills off long established perennials, reduces the amount of re-growth year after year, eliminates heavy seed germination, and prevents outside encroachment in subgrade. With it, you can obtain weed-free track now and for years to come at diminishing annual costs!

GENERAL CHEMICAL WEED CONTROL

Weed Killer Department

GENERAL CHEMICAL DIVISION

ALLIED CHEMICAL & DYE CORPORATION

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General Chemical "Custom Service" employs these proven weed and brush killers!

General Chemical Formula 7 (TCA, Acid in an Oil Base)	• For general purpose grass control. • Used with one of the additives listed for over-all control of weeds.
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General Chemical Formula 7 B-D	• For control of very resistant weeds and grasses. The amount of 2, 4-D has been increased and fortified by pentachlorophenol.
General Chemical Sodium TCA (Liquid Concentrate)	• For soil treatment of noxious grasses. • For all-purpose weed control when used with one of the ester additives listed.
General Chemical Emulsible PCP—Aromatic Oil	• Low cost contact type killer for use where weed and grass control problems are not severe . . . contains Pentachlorophenol
General Chemical 2, 4-D Amine Additive	• Used in conjunction with General Chemical Formula 7 for all-purpose weed and grass control.
General Chemical 2, 4-D Ester Additive	• For use with General Chemical Formula 7 or Sodium TCA where cotton or other plants susceptible to 2, 4-D are not present.

General Chemical 2, 4-D—2, 4, 5-T Ester Brush Killer (Water Soluble)

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DIGGING DITCHES?

LAYING TRACK?

USE A LORAIN

■ Each of these right-of-way jobs is a different operation . . . and each railroad is using a Lorain best suited to the work. For your construction, maintenance or yard jobs, you will find Lorain *selection* the answer to greatest efficiency and lowest cost. Here's how you can select for your needs — when you get a Lorain . . .

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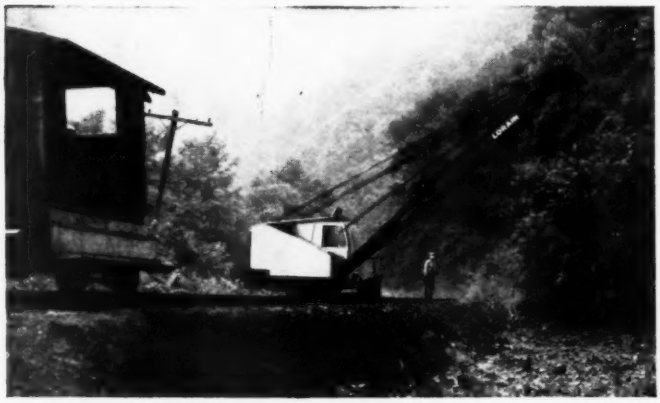
3 TYPES OF MOUNTINGS . . . to meet any travel condition — to work on-or-off track, on-or-off cars — you can mount Lorains on crawlers, or use rubber-tire carriers as 2-engine (30 m.p.h.) Moto-Cranes or single-engine (7 m.p.h.) Self-Propelled machines.

5 FRONT ENDS . . . to lift, load or dig anything from rock to rails, you can use your Lorain as shovel, crane, dragline, clamshell or hoe. And each front end is interchangeable, for real versatility.

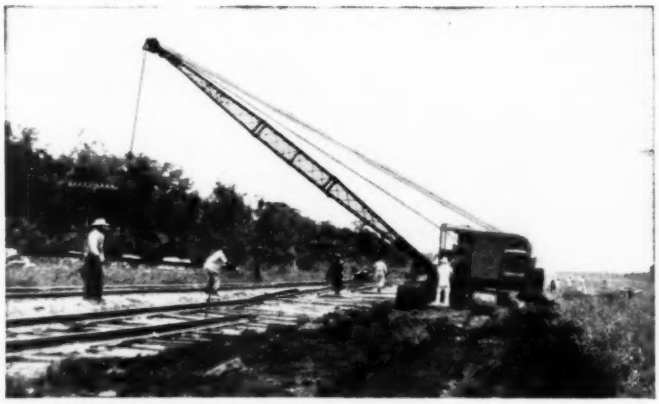
Yes — there *is* a Lorain size and type to serve the needs of your road. See your Thew-Lorain Distributor to get the best shovel-crane — a Lorain!

THE THEW SHOVEL CO., LORAIN, OHIO

BUILDING BRIDGES. Here, a Lorain Moto-Crane with rubber-tire mobility gets to the job fast — does a he-man's job — then off to where it's needed next.



DIGGING DITCHES. Here, a crawler mounted Lorain TL25-J clamshell, an entirely different mounting and front end, fits the needs of this railroad.



LAYING TRACK. This Lorain-50 crane handles track from alongside the right-of-way. Lorain crawlers are available in many lengths and widths to suit travel and job conditions.

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DRAGLINES • CLAMSHELLS
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Don't Waste Your Manpower on Weeds!...Switch to BORASCU® WEED KILLER

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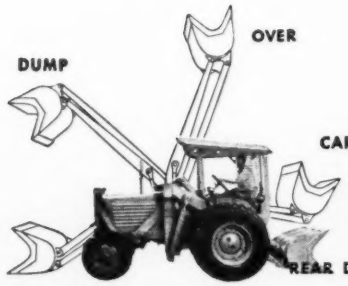

Digs in Rear . . . or Digs in Front

AND, IT MULTIPLIES TRACTION . . . SAVES TURNING
MAKES STEERING EASIER . . . INCREASES STABILITY

Push-Tilt assures fuller buckets even in fine plaster sand.

It takes plenty of traction to move from bank to truck in rough going like this. Rear-carried bucket makes it possible. And, in hard banks, the extra traction and Push-Tilt give you the same fast, profitable loading.

But here is its Biggest Advantage . . . ADDED TRACTION FROM REAR-CARRIED BUCKET

An Oliver Industrial Wheel Tractor and Strait-Line Loader is the biggest profit asset for any loading operation. It digs in back . . . or digs in front . . . *and loads in front.* No time-wasting turning or backing required.

Here's proof. These photos were taken loading out *plaster sand,* so fine it squirted out through a ten-penny nail hole in the truck body in a stream 4 inches long. Despite this difficult going, the tractor and Strait-Line wheeled its bucket loads *upgrade* without spinning. It ran back from truck to bank with force. This extra traction for difficult conditions is created by the rear carried bucket.

This is a condition where rear digging solved the problem. In fact, under most conditions, the operator can do *more* with rear digging.

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A complete line of industrial wheel and crawler tractors.

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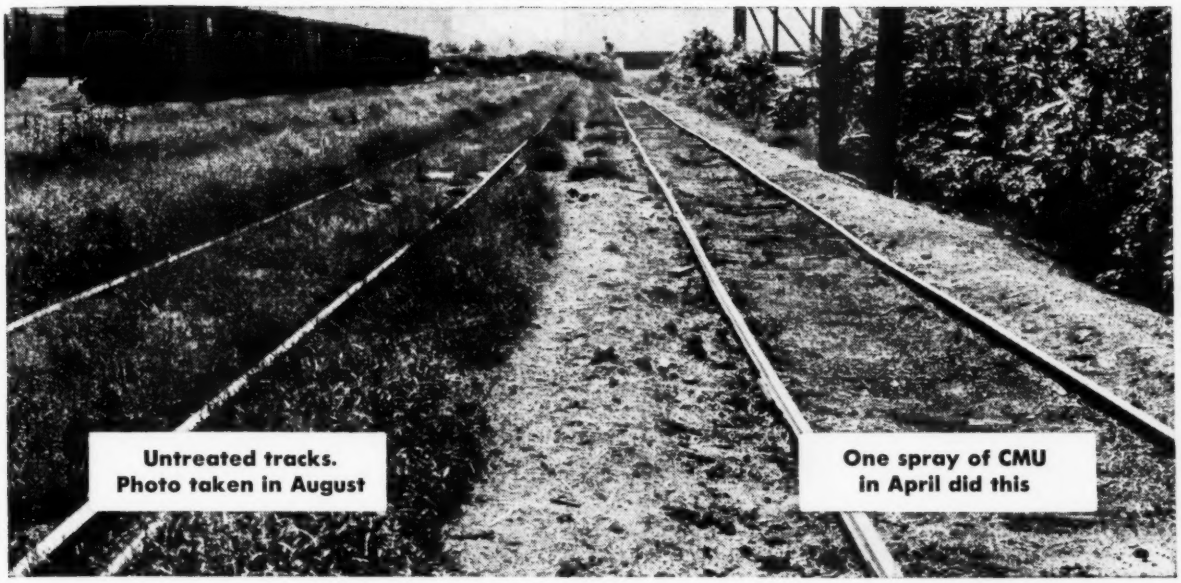

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KEEPS GROUND BARE OF ALL VEGETATION

Here is a new effective way to keep weed growth out of ballast, switches, sidings, firebreaks and yards. New Du Pont 80% CMU Weed Killer destroys grass, broadleafed weeds and other vegetation. And one application does the job for as long as a year!

This effective new chemical weed killer is absorbed by the roots, and gives thorough results. Tests throughout the United States and Canada have shown conclusively that CMU Weed Killer really keeps the ground bare. It's ideal to protect all kinds of outdoor railway installations, and reduce fire and maintenance problems.

Du Pont CMU has other advantages, too. It is non-volatile, so there's less danger of spray drift damage. It is non-flammable and non-corrosive.

Get this free leaflet *on uses of new Du Pont 80% CMU Weed Killer. For full details on CMU as well as "Ammate" and other Du Pont weed and brush killers, write Du Pont, Grasselli Chemicals Dept., 5031 Du Pont Bldg., Wilmington, Delaware.*

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*REG. U. S. PAT. OFF.

On all chemicals always follow directions for application. Where warning or caution statements on use of the product are given, read them carefully.

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AMMATE® KEEPS BRUSH DOWN WITH FEWER SPRAYS

For lower-cost brush control, "Ammate" Weed Killer is ideal. Many users report "Ammate" sprays once every five years control brush along their rights-of-way. Thus it is possible for maintenance crews to cover more ground more economically.

"Ammate" does not leave soil unproductive, so grass and low growth come back to control erosion. It's non-flammable, non-volatile. For further details, write to Du Pont.

DU PONT
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No. 280 of a series

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Railway Engineering and Maintenance

SIMMONS-BOARDMAN PUBLISHING CORPORATION
79 W. MONROE STREET
CHICAGO 3, ILL.

Subject: Covering A Convention

April 1, 1952

Dear Readers:

Once or twice in the past we have referred in this space to the fact that the editors of Maintenance comprise the engineering editorial staff of the Railway Age, Simmons-Boardman's railway weekly. To carry out our responsibilities to both magazines is a never-ending, exacting, but stimulating, task. The necessity of meeting five "dead lines" each month is a chore calculated to keep any four-man staff busy.

One of our most difficult assignments is to "cover" in the Railway Age the annual convention of the American Railway Engineering Association. In the conviction that news should be printed while it's still news our policy is to publish a complete story on the convention in the first issue of the Age following the meeting. This year the convention was held March 11 to 13, inclusive, which meant that we had to have our story in the Age of Monday, March 17. Actually, since copies of the issue had to be mailed to subscribers from the print shop on Friday, March 14, there was a time lapse of only one day between the close of the convention in Chicago and the mailing of the magazines from the print shop at Orange, Conn.

On the face of it this would seem to be an impossible assignment. It probably would be except for the fact that the committee reports, which comprise the backbone of the convention program, are printed in advance in the monthly bulletins of the A.R.E.A. It is also possible to obtain advance copies of most of the addresses. Thus, we are able to write the bulk of the convention story before the meeting starts, leaving gaps for the addresses still to come and for certain other information that will not become available until later, such as the total registration and the results of the election of officers.

So far, it sounds relatively simple. But there's a catch—a catch created by our desire to illustrate the convention story with candid photographs of railway men attending the meeting. To allow time for engravings to be made these pictures had to be sent to our New York office—air mail, special delivery—on Tuesday afternoon, the first day of the convention. The last picture was taken about 11 a.m. By prearrangement with the developer, the prints were ready about 2 p.m. and were on their way to New York a short time later. All that remained after that was to wire the results of the election of officers to the New York office on Wednesday, and telephone the final registration figures direct to the print shop on Thursday along with a report on the action taken relative to recommendations of the committees regarding Manual material.

Such performances are not, of course, confined to our organization. They are common occurrences in the publishing business, made possible by careful planning and intra-organizational teamwork, spiked with a generous portion of enthusiasm. However, no matter how often it happens, it's still a thrill to come down to the office on the Monday following the A.R.E.A. convention and find a copy of the Railway Age containing a complete story of the meeting.

Yours sincerely,

Merwin H. Dick

Editor

MHD:ag

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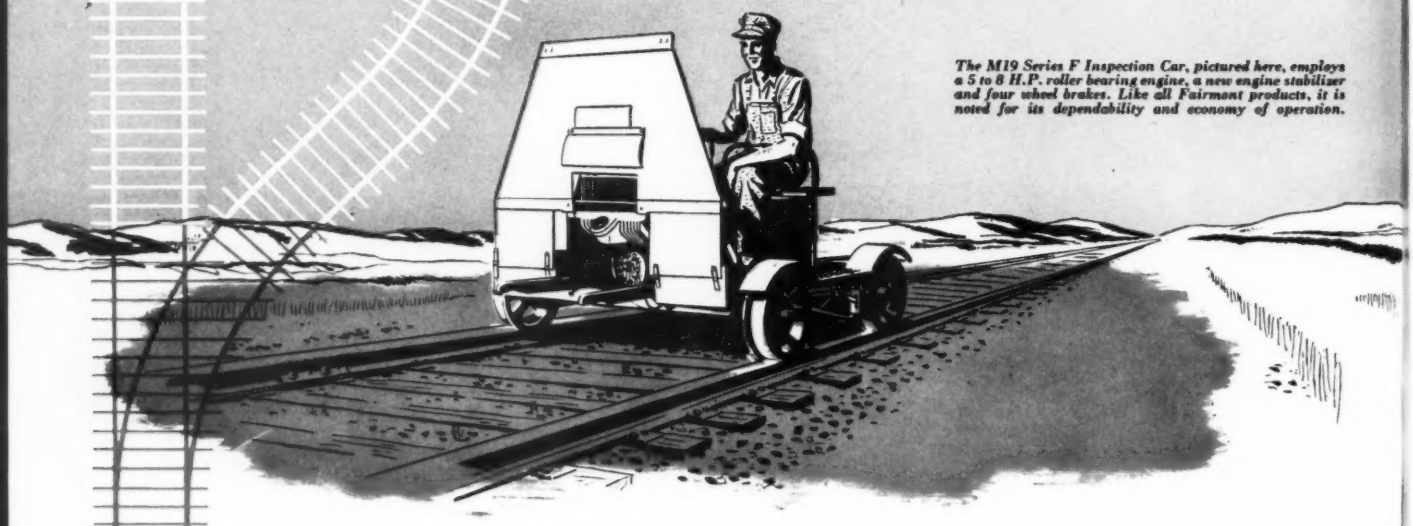

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Railway Engineering and Maintenance

NAME REGISTERED U. S. PATENT OFFICE

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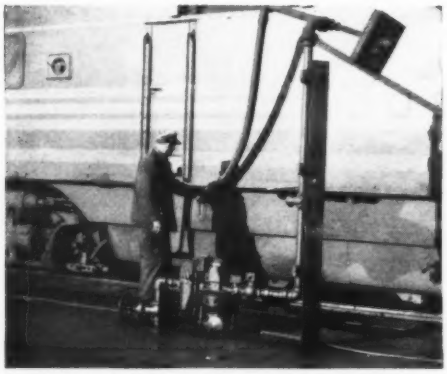

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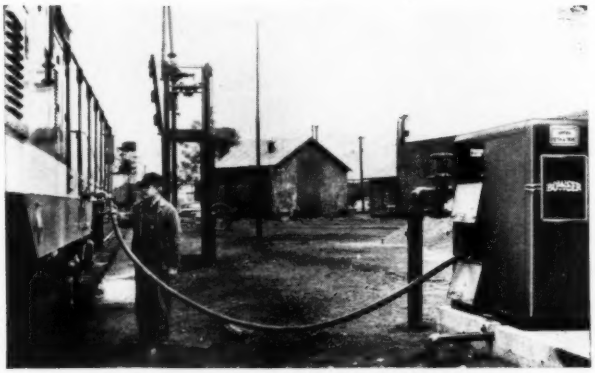

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Track Structure —

What Does the Future Hold?

Research activities aimed at perfecting devices, methods and equipment that will reduce track-maintenance costs are at the highest level in history. Acting collectively, and with the aid of professional researchers, the railroads are prying into every phase of the track structure in an effort to overcome its weaknesses. Moreover, almost every railroad of any size is carrying out one or more research projects of its own, all with the same objective. One need only to attend a convention of the American Railway Engineering Association to see for himself the extent to which the railroads are relying on research to solve their track problems.

These efforts are already paying substantial returns. From his own knowledge and experience any track maintenance man can think of at least several ways in which his work has been made easier and track maintenance costs reduced by improvements that have come out of some research project. Unquestionably, current research efforts will point the way to many additional cost-saving improvements in the future. Continuation of these efforts, possibly even on an expanded scale, is a "must" in the railroads' program to achieve economic security for themselves and their employees.

It seems well worth noting, however, that practically all current research projects on track problems appear to be predicated on a common underlying assumption—that the present basic track structure is the most efficient and effective form of construction that can be devised to carry railroad equipment and loadings. In other words the fundamental objective of the research seems to be to strengthen or improve details of the existing structure.

There can be no question but that this is a sound approach to the problem. The present form of track construction will certainly be with us for a good many years to come and possibly for all time. Future events may well confirm the assumption that it is the most economical form of construction for the function it performs. On the other hand there are those, including practical track men, who are beginning to wonder if some changes in the basic elements of the track structure may not be necessary to assure maximum economy. Admittedly there is a certain haziness about such thinking, the only really definite element in it being the general notion that there must be some form of construction that would be more economical, considering both first cost and upkeep, than the one now ued.

This magazine is frank to admit that it doesn't know the answer. However, there is a deep-seated element in the situation that no railroad man can permit himself to forget for a moment; that is the fact that the only way the railroad industry can hope to survive in the future is to effect substantial economies wherever possible. The maintenance department must do its share in meeting this situation. If there is a possibility that such economies can be obtained through basic changes in the track structure, perhaps it will be worthwhile to devote a share of available research funds to an investigation along these lines.

CONVENTIONS—

Can Be Made to Count More

EVERY ONE of the 2075 members and guests who attended the convention of the American Railway Engineering Association in Chicago last month certainly should have been enriched by this experience.

Unquestionably, members of the A.R.E.A. standing and special committees are the ones who profit most through the work of the association because of their participation in the preparation of the reports. But what about the others attending the convention? How did these other men gain by their presence at the meeting? Those who are members of the association did not have to go to the meeting to take advantage of the committee work because all of the accumulated data and conclusions had previously been made available in the detailed reports printed in the bulletins. Undoubtedly, for those not working on committee assignments, the fruit of this convention was in the addresses given to supplement the reports, in the contacts made with other men engaged in the same line of work, and in the exhibits on display at the Coliseum.

There is a growing tendency among railway engineering and maintenance officers to encourage the attendance of their supervisory personnel at these conventions. It is common knowledge that some roads expect their division engineers and higher officers to attend and as many other men in the maintenance department as can be spared. Some roads extend this same privilege, with expenses paid by the company, to their roadmasters, chief carpenters, supervisors, etc., on a rotation basis by which some can have the opportunity of attending a convention every other year. The reasoning is that these employees will be given an opportunity to see the newer machines and products that are available for their work, and will learn how such work can be done with greater efficiency.

But what assurance does the railroad have that the desired results are being realized? While the supply men manning the exhibits are only too happy to answer questions about their products and the savings possible through their use, some men are reluctant to ask questions. The fact is that a complete understanding cannot be obtained through visual observation alone. In view of the hesitancy on the part of some railroad men to study exhibits carefully and to raise questions with those in attendance, some motivation must be devised to assure that they will do this.

So one railroad, which sent 17 of its employees to the convention, gave each man an assignment, with the understanding that, upon his return, he would prepare and submit a written report. One man was given an assignment to find out all about tie removers, another about yard cleaners, a third about tamping machines, etc., thus assuring that each man would obtain a thorough understanding of at least one line of products and that the information obtained could be made available to others on the railroad. Another advantage of this plan is that, in formulating the salient features and advantages of the product and writing them down in a report, these facts become firmly established in the mind. Perhaps other roads will wish to adopt this plan for future use.

EQUIPMENT IMPROVEMENTS—

To Effect Them Requires Cooperation

Much of the work equipment and many of the roadway machines marketed for use on American railways have been designed for single and specific purposes and for that market alone. From their very inception many of these machines have been the result of cooperation between maker and prospective user. In some cases they are mere improvements over their "homemade" prototypes which were born of local necessity but which showed promise of more widespread utility. Some have been secretly conceived by equipment manufacturers and "sprung" on pleasantly surprised customers and crestfallen competitors.

Regardless of how such equipment originates, it seldom can be said to meet with the unanimous and complete approval of all railway buyers and users for which it is intended. From the supplier's standpoint, herein lies one of the greatest nuisances of selling to the railway maintenance-of-way market. He expects to have to get the "bugs" out of every new machine, but he sometimes gets frustrated, if not worse, by the continuing demands for changes by almost every individual customer. What suits one, won't suffice for another. As a consequence, few pieces of his equipment can ever be given production-line treatment with its consequent economies. He wants to give his customers what they want, but he would like to have them cooperate with each other and thus with him in effecting a minimum of changes to get all the improvements necessary.

To assist in this cooperation, the A.R.E.A., through its Work Equipment Committee, has established a subcommittee on "Improvements to be Made to Existing Equipment." This subcommittee, charged with the responsibility of offering "constructive criticism by which manufacturers can make their machines more acceptable to prospective purchasers," can be a clearing house which will assure that units of maintenance equipment needing improvements will attain their maximum potential usefulness in a minimum of time. The committee, therefore, deserves the cooperation of all.

Some manufacturers have already cooperated to the extent that several of the changes suggested in the committee's first report have already been put into effect. Others have not been quite so eager to do so. Whether or not the equipment users will also cooperate by offering their suggestions to the committee for unified action remains to be seen, but unless the cooperation is balanced and complete on both sides, the potential worth of the committee to suppliers and railways alike can never be fully realized.

BAGGED CONCRETE, pinch batting for unavailable stone on Erie relocation project . . .

. . . Makes a "Hit" as Riprap

Man-Made "rocks," while still in a plastic state, were laid in rows, reinforced by driven dowels and tamped to a uniform thickness and relatively smooth surface by pneumatic compactors, thereby providing highly efficient embankment protection.

By W. R. Swatosh

Assistant Engineer
Erie, Cleveland, Ohio

• Out of a large construction project—a line change to eliminate grade crossings at Corning, N. Y.—has come a rather unusual but satisfactory solution of a problem frequently encountered in the maintenance of railway embankments—adequate protection against stream erosion during high water. To a great extent necessity mothered this solution.

In the first place, the best location for our relocated tracks paralleled the Chemung river and Post creek on the east end and crossed the Cohocton and Tioga rivers on the west. Efficient embankment protection was essential in all these locations, at one of which the river flows almost directly toward the embankment by which the flow must be deflected.

In the second place, rock for riprap with which to pave these embankments was not available in substantial quantities in the vicinity. To import it from distant sources was too costly. Therefore, the engineers sought an economical substitute which would be as efficient as rock and easier to handle, if possible. The substitute finally decided upon was bagged concrete.

With this decision made, how could we satisfactorily anchor the toe of the bagged riprap? After considerable study, two methods were selected—one to be used where the toe of slope would normally be exposed to the direct flow of the water, and the other where it would not be so exposed. In the first method, 16-ft. Carnegie M-115, self-sustaining sheetpiling was driven 8 ft. into the ground and a rock-fill toe, approximately 4 ft. by 6 ft. by 10 ft. in section, was placed on the water side of the sheeting. In the second method the bagged riprap was anchored with toe walls consisting of rock-filled trenches approximately 3 ft. by 6 ft. in section.

Design plans for the bagged riprap indicated three typical slope sections on which it was to be placed—1 on 1¾; 1 on 2; and 1 on 2½. The plans also provided for the bags to be lapped a minimum of 12 in., and reinforced with ⅝-in. round dowels, 6 ft. long, driven through the bags on 16-in. centers.

In general the specifications adopted for the bagged concrete conform with those used by the New York Department of Public Works. They provided: (1) For the use of second-hand burlap bags (potato sacks) in good condition; (2) that each bag contain at least one cubic foot of slightly moist concrete thoroughly packed; (3) that bags were to be closed by tying, or some other approved method, so that the burlap would fold flat under the full width of the bag; and (4) that no interstices would obtain at the adjacent corners of the bags when they were laid and then tamped with heavy

1 SHEETPILING was driven in accordance with the cross-section (4) shown on the opposite page to anchor the toe of the bagged riprap where it would normally be exposed to the direct flow of water. Elsewhere, rock-filled trenches sufficed

wooden tampers to a minimum thickness of 9 in.

Strict adherence to these specifications was impossible. A scarcity of burlap precluded the procurement of the necessary 400,000 bags made of that material. However, cloth cement bags were available and tests indicated that these bags would meet the requirements. A cement bag which measures 28 in. by 12 in. when empty contains 1 cu. ft. when filled with concrete, and occupies a space 16 in. by 12 in. by 9 in.

To find a satisfactory manner of tying the bags various methods were tried. Hand sewing was discarded as being inefficient because of the high breakage of needles and lack of qualified seamstresses. A modified Bostitch stapler (Model C-63) was the final solution. To permit reasonably rough handling, 8 staples, ¾ in. long were used. An interesting sidelight to this solution was the debate over whether 7 or 8 staples were necessary. This appears to be a minor item, but it involved nearly half a million staples.

Tests were conducted to determine the proper moisture content of the concrete. Sample sections were placed having from 0 to 5 gal. of water added at the mixer. These sample sections were sprinkled and cured for 7 days under identical conditions. When they were broken at the end of that time it was interesting to note that no difference in appearance could be discerned. Continued testing developed that too little water in the mix led to segregation and "balling-up" of the concrete in the mixer, whereas too much water led to difficulty in placing and prevented satisfactory tamping in final position. It was finally concluded that a water content of approximately three gallons per bag produced the most satisfactory results.

Mixing Method

The concrete was mixed in the proportions of 1–2½–5. A central mixing plant using a 27E paver, which handled a 5½-bag batch (5 of portland cement and ½ of natural cement), was found to be the most efficient. The water content of 3 gal. per bag finally resolved into 15 gal. added at the mixer with slight variations due to the moisture content of the sand and small stone. The presence of natural cement was a major factor in the handling characteristics of the mix.

From the contractor's viewpoint the transportation of the concrete and the placing of the riprap were the keys to economy of operation. A special truck body was devised featuring a welded tail-gate sloping toward the front of the truck at a 45-deg. angle and equipped with short chutes and gates permitting three bags to be filled simultaneously at the site. Each of these truck bodies had a capacity of three batches.

The bags were filled and stapled at the top of the slope and allowed to slide down the embankment on wood skids to avoid disturbing the grade. In some instances tarpaulins were also laid on the slope to allow the bags to be rolled into approximate position. After being placed in final position by hand, the ¾-in. dowels were driven and initial tamping and sprinkling begun.

The strength of the cloth cement bags permitted mechanical compaction of the riprap. For this purpose, an Ingersoll-Rand backfill tamper (Model No. 34) was used and produced a finished surface resembling slope paving. This mechanical tamping served to wedge the individual bags together and produced a uniformity that was superior to the customary hand tamping method using heavy wooden tampers prescribed in the specifications. In this manner a labor gang of 35 men mixed, transported, bagged, tied and placed an average of 600 sq. yd., or 4,000 bags, per day.

The finished product was cured by continuous sprinkling for a period of seven days. Soaker hoses and lawn sprinklers were used at various times experimentally, but the most satisfactory results were obtained from the use of a water truck or pump and a man with a 1¼-in. hose. Test cylinders which were taken periodically produced minimum strengths of 2,500 p.s.i. at 28 days.

To obtain a substantial job and at the same time secure protected slopes that were pleasing to the

2 CONCRETE was delivered to the site in trucks equipped with special bodies designed to dump it into cement sacks . . .

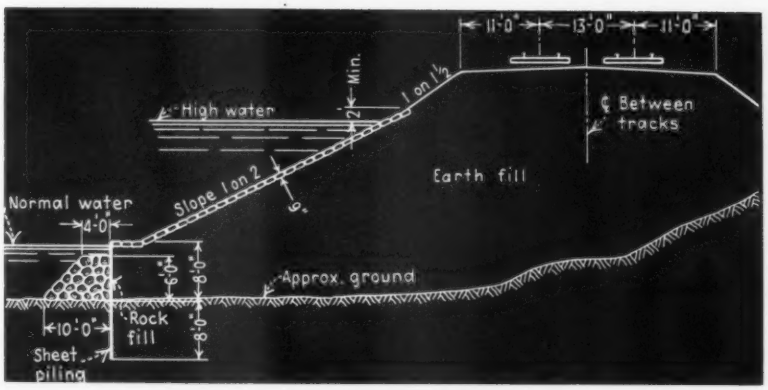
3 . . . FILLED BAGS, stapled shut, were allowed to slide on wood skids down the embankment; then set on edge and tamped

eye, a true, fine slope grade had to be carried at least 100 ft. in advance of the placement operation. To effect this a grade line was carried up the slope every 50 ft. If the slope distance was 30 ft. or more, an auxiliary line was carried longitudinally midway of the slope in addition to one each along the top and bottom. These lines were supported on stakes at 10-ft. to 15-ft. intervals to eliminate line sag and preclude errors in the calculation of grade.

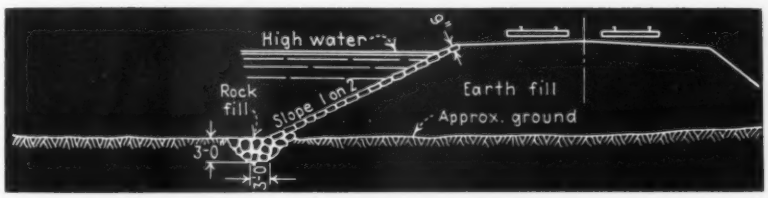
As each bag took the surface of the grade directly under it, this phase of the work was vital in securing a riprap surface that was smooth and true. Under no circumstances were the bags placed on a subgrade that was too wet, because under such conditions the movement of bags and men tended to force the earth down the embankment slope into ridges and hollows.

Next in importance in securing final surface uniformity was the use of pneumatic backfill tampers. The use of these tools made the difference between an average job and the superlative one obtained at Corning.

Where possible the bagged riprap was placed from the bottom to the top of slope in one continuous operation over an embankment area from 50 ft. to 100 ft. long. This made a better looking job than could have been obtained by carrying the lower half of the work, say for two or three days, and then returning and placing the



4 FIRST METHOD—Employed wherever the toe of riprap started at normal water level



5 SECOND METHOD—Used where the top of slope is above the normal water line

top half. At Corning, this latter method was reserved for use in getting quick protection from high water, a necessity which did not materialize.

The placing of 56,500 sq. yd. of bagged riprap in this manner was only one of the many items of work involved in the elimination of Erie grade crossings in Corning all of which was carried out by Lane Construction Corporation as prime contractor under the direction of G. D. Helmer, project manager. The plans, specifications, and general conduct of the elimination project were approved and supervised by E. W. Wendell, deputy chief engineer of the New York State Department of Public Works, and I. H. Schram, chief engineer, Erie.

For their help in supplying data for this article the writer's appreciation is hereby extended to W. F. Bishop, New York State project engineer, and his associate, M. M. Bailey.

A.R.E.A. Holds Successful Meeting

Near record group attended the association's fifty-first annual convention at Chicago last month. Exhibit of manufacturers' products, with 119 companies taking part, was big attraction.

Convention Pictures

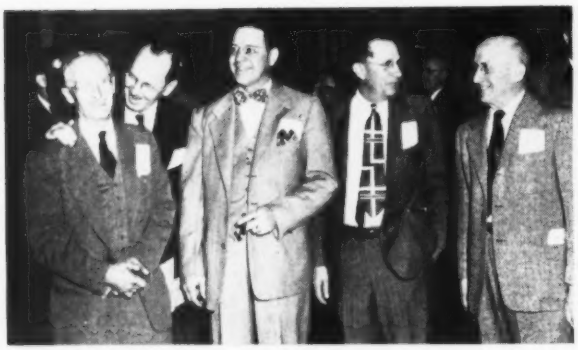
One of the advantages of attendance at the A.R.E.A. convention is the opportunity it affords for renewing old acquaintances, making new ones and "talking shop." The candid pictures shown on these and the following pages are ample evidence that this opportunity is not neglected.

T. A. Blair, president of the A.R.E.A.

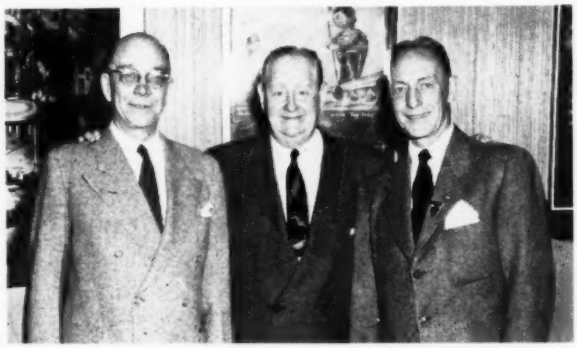
• Attendance at the fifty-first annual convention of the American Railway Engineering Association, held March 11-13 at the Palmer House, Chicago, almost hit a new high record. A total of 2075 members and guests registered at this meeting. Of this total 1188 were members and 887 were guests. The total compared with 1707 members and guests in attendance at the 1951 convention, and was only slightly below the record registration of 2124 members and guests at the Golden Anniversary convention held in 1949.

In accordance with the usual practice the principal business transacted consisted of the presentation and consideration of reports of the association's technical committees, now consisting of 21 standing commttees and one special committee, the latter being the special committee on Continuous Welded Rail. The technical sessions of the convention also involved the reading of 15 addresses, all of which were presented in conjunction with committee reports.

That the A.R.E.A. is continuing to advance all along the line was evidenced by the reports of T. A. Blair, chief engineer system, Atchison, Topeka & Santa Fe, and Secretary Neal D. Howard. The highlights of these reports are that the association's finances are sound; that the membership is continuing to grow (a net of 98 new members having been added during the past year to make a total of 3,190); that there is a keen interest on the part of members in the work of the committees, as evidenced by the fact that 949 members are now serving on committees as compared with 910 a year ago; that there was a



From the Santa Fe—J. R. Rushmer; C. H. Sandberg; George N. Sells; W. W. Barger; R. A. Van Ness



C. J. Geyer, president-elect, A.R.E.A.; E. D. Cowlin, Eaton Mfg. Co.; Jess Mossgrove, president-elect, N.R.A.A.

In Grand Ballroom of the Palmer House during the opening session on March 11

substantial increase in the number of committee meetings held during the year; that work is proceeding on a project looking to the revision and publication of the association's Manual in 1953; and that the research activities of the association in cooperation with the research staff of the Engineering Division, Association of American Railroads, were stepped up somewhat in 1951.

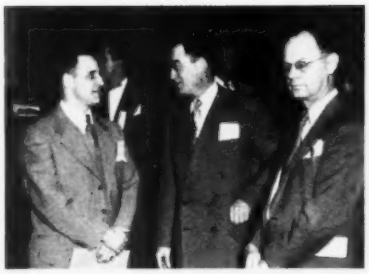
President Blair placed special emphasis on the growth and importance of the junior membership in the association. He pointed out that this class of membership showed a net gain of 37 during the past year, giving a total of 257 juniors, or 8 per cent of the total membership. "Your Board of Direction," he said, "considers one of the major obligations to be the development of plans which will give these juniors an opportunity to develop in association work as quickly as they acquire railroad experience."

Specific figures on the research program, as given in the secretary's report and in an address by G. M. Magee, research engineer, Engineering Divison, A.A.R., showed that, while the 1951 research budget included 32 research projects estimated to cost $354,770, the approved budget for 1952 includes 34 projects estimated to cost $381,400. According to Mr. Magee the more important research work carried out in 1951 was a continuation of the investigation of shelly spots in rails, of the service and rolling load tests of new joint bar designs,

C. Halverson, G. N.; E. Larson, Ziegler & Co.; W. J. Cruse; L. G. Reichert; R. R. Manion; H. J. Seyton—all G. N.

F. R. Spofford, B. & M.; W. H. Huffman, C. & N. W.; H. M. Harlow, C. & O.; H. D. Curie, B. & O.

W. H. Hamilton, Montour; H. W. Kellogg, Chesapeake & Ohio



G. H. Paris, Portland Cement Assoc.; W. E. Cornell; E. Green—both Nickel Plate

J. L. Gressitt, Pennsylvania; L. H. Winkler, Bethlehem Steel Co.

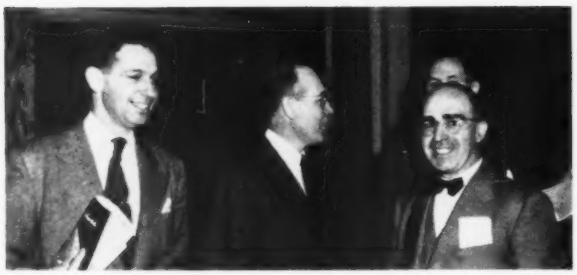
From the Louisville & Nashville—C. Soard; P. R. Estes; I. W. Newman; and H. C. Forman

J. R. Rushmer, A. T. & S. F.; J. E. Fanning and G. M. O'Rourke—both of the Illinois Central

R. K. Johnson, C. & O.; W. J. Savage, Texas & Pacific

B. A. Bates, C. of G.; L. W. Funk, A. C. L.; G. H. Echols, Southern

W. W. Kelly and T. A. Blair—both of the Santa Fe



Representatives from the Pennsylvania—F. D. Day; J. W. Reed; and J. A. Jorlett

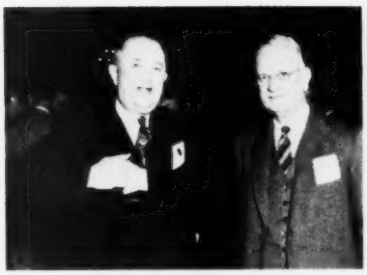
From the New York Central—M. L. McCauley; M. J. Plumb; E. A. McLeod; and L. J. Creelman

of tests on fastenings and tie pads designed to reduce the mechanical wear of crossties, and of research on spring washers for crossing frogs. He pointed out that considerable progress was made in the riding-comfort tests on curved track for modern types of passenger cars, that structural projects continued to be an important part of the research program, comprising 40 per cent of the activities, and that the first report was made this year on the work on vegetation control by chemicals, and that the fourth year has been completed in the five year crosstie research investigation.

The members were reminded by President Blair of "our obligations in connection with this research program," pointing out that recommendations for research projects originated in the committees and he said that these committees have the obligation to submit their recommendations for any research project that reasonably may be expected to result in economies to the railroads. After a research project has been initiated it becomes the responsibility of the committees and officers of the association, according to Mr. Blair, to see that the project is conducted in such a way as to make available to the railroads information that will be beneficial. "If we fulfill this obligation," he said, "and periodically

R. E. Butler and G. R. Wintrich—both of the Newburgh & South Shore

From the L. & N.—J. W. Caywood; M. W. Cox; Edward Wise, Jr.



C. H. Mottier, Illinois Central; A. C. Clarke, Baltimore & Ohio

I. H. Schramm, Erie; P. L. Schultz, A. T. & S. F.; M. J. Zeeman, also of the Santa Fe

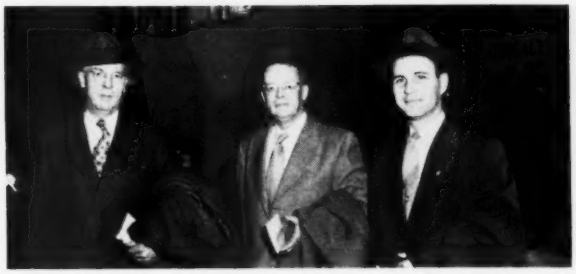
E. L. Anderson, Frisco; W. A. Schubert, Frisco; H. W. Cutshall, Electric Tamper & Equipment Co.

J. C. DeJarnette, Jr., and J. A. Blalock—both of the R. F. & P.

J. S. Reagan and F. W. Biltz—Reading; W. E. Gadd, Taylor-Colquitt Co.

H. R. Clarke, Burlington; F. J. Bishop, Akron, Canton & Youngstown

From the Chicago & North Western—R. D. Nelson; O. W. Smith; J. J. McCoy; and J. F. Montgomery



From the Illinois Central—J. M. Trissal; Earl F. Snyder; and Alan L. Sams

analyze the methods of handling these projects, I am sure we will never lack for funds to carry on research."

The only features of the convention program not dealing directly or indirectly with the work of the association were two addresses, one by J. H. Aydelott, vice-president, Operations and Maintenance department, A.A.R., whose subject was "The Impossible in Transportation—Can the Railroads Stage a Repeat Performance?" and one by F. G. Gurley, president, Atchison, Topeka & Santa Fe entitled "Engineers Should Do more and Do It Better." Since Mr. Aydelott could not be present his address was read at the opening session on Tuesday, March 11. Mr. Gurley read his address at the annual luncheon on Wednesday, which attracted a record crowd of 1256 persons.

The following officers were elected to direct the affairs of the association during the ensuing year; President, C. J. Geyer, vice-president-construction and maintenance, Chesapeak & Ohio, who was advanced from senior vice-president; vice-president to serve for two years, G. W. Miller, engineer maintenance of way, Eastern region, Canadian Pacific, Toronto, Ont.

The directors named were: E. E. Mayo chief engineer, Southern Pacific, San Francisco, Cal.; S. R.

C. J. Geyer, C. & O.; A. B. Pierce, Southern

C. B. Bronson, N. Y. C.; C. N. Riddle, Bethlehem Steel Co.; R. L. Groover, A. C. L.

From the Chicago & North Western—Dusty Rhodes and A. G. Beatty

Blair Blowers, Erie; C. R. Wright, Nickel Plate; W. M. S. Dunn, Nickel Plate

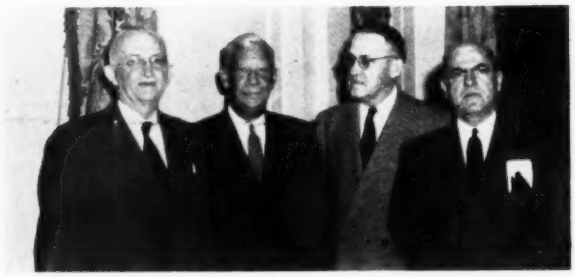
M. L. Haverland; S. E. Tracy—both Chicago, Burlington & Quincy; V. W. Oswalt, Southern

Carl H. Johnson and Justin F. Smith—both Illinois Central

E. Osland, A. T. & S. F.; R. J. Gammie, T. & P.; S. H. Poore, C. & O.

From the Texas & Pacific—L. W. Robinson and F. O. Danford

From the Chicago, Burlington & Quincy—H. M. Spencer; E. A. Graham; and H. P. Gillespie



J. B. Akers, Southern; C. B. Harveson, B. & O.; L. T. Nuckols, C. & O.; S. R. Hursh, Pennsylvania

Hursh, assistant chief engineer-maintenance, Pennsylvania, Philadelphia, Pa.; Ray McBrian, engineer standards and research, Denver & Rio Grande Western, Denver, Colo.; and M. H. Dick, editor, *Railway Engineering and Maintenance*, Chicago. Members of the nominating committee are: C. B. Porter, assistant chief engineer, Chesapeake & Ohio, Richmond, Va.; F. G. Campbell, chief engineer, Elgin, Joliet & Eastern, Joliet, Ill.; C. B. Harveson, chief engineer maintenance, Baltimore & Ohio, Baltimore, Md.; J. F. Marsh, engineer of bridges, Chicago, Rock Island & Pacific, Chicago; and A. B. Hillman, assistant chief engineer, Chicago & Western Indiana, Chicago.

In addition, C. G. Grove, chief engineer maintenance of way, Western region, Pennsylvania, and vice-president of the association, was automatically advanced to senior vice-president succeeding Mr. Geyer. Railroad men visiting the convention had an additional incentive for being at Chicago at that time. This was the huge display of manufacturers' products that was staged at the Coliseum by 119 companies under the sponsorship of the National Railway Appliances Association. An account of the annual meeting of the N.R.A.A. will be found in the news pages of this issue.

This timber trestle was constructed with laminated posts, caps and stringers; all members were creosoted after being glued

Glued, Laminated Wood Members . . .

• What they are • Their strength characteristics
• Their advantages • Applications on the railroads

By Alan D. Freas
Engineer
Forest Products Laboratory
Madison, Wis.

• Because they are such large users of wood the railroads have a big stake in the forest economy of the nation and in developments which affect that economy. Laminated wood is one of the developments in timber use that has already demonstrated its merit, and that may well prove to be a profound influence in the timber economy.

Since the terms "laminated wood" and "plywood" are sometimes confused, clarification is desirable. By glued, laminated wood, we mean an assembly made by bonding layers of veneer or lumber so that the grain direction of all laminations is essentially parallel. In plywood, on the other hand, the layers of veneer, or veneer and lumber, are cross-banded, usually with the grain directions of adjacent layers at right angles.

Laminated wood is commonly made from material in lumber thicknesses (nominally 1 in. or 2 in. thick), but may, for special uses, be made of veneer. For curved members, the thickness must be such as to permit bending to the required radius.

Glued laminated wood has a number of advantages over solid lumber or timbers. A few of these of greatest significance to railroad men are:

Essentially unlimited size possibilities. This is of particular importance to the railroads in view of the diminishing stands of timber that furnish the large sizes required for such applications as bridge stringers.

Improved utilization of our timber resources. Standard commercial sizes of lumber, which would otherwise have little or no structural application, may be used to produce large structural members for exacting applications. Further, lower grades of lumber than are used in the outer, higher-stressed laminations may be utilized in the inner, lower-stressed laminations of beams and arches without serious detrimental effect on the strength of the member.

Freedom from severe checking. Since the laminations are generally thin enough to be readily seasoned without severe seasoning degrade, and since gluing requirements necessitate relatively low moisture contents, the checks and other defects commonly associated with large one-piece members may be avoided. Further, dimensional changes after installation in a structure are reduced.

The possibility of designing with stresses based on the dry strength of wood. The initial dryness of the laminations permits us, for dry conditions of use, to use design stresses based on the dry strength of the wood. The added strength, as compared with large, one-piece members, depends upon the strength property in question, but in some cases it is quite large (up to nearly 40 per cent).

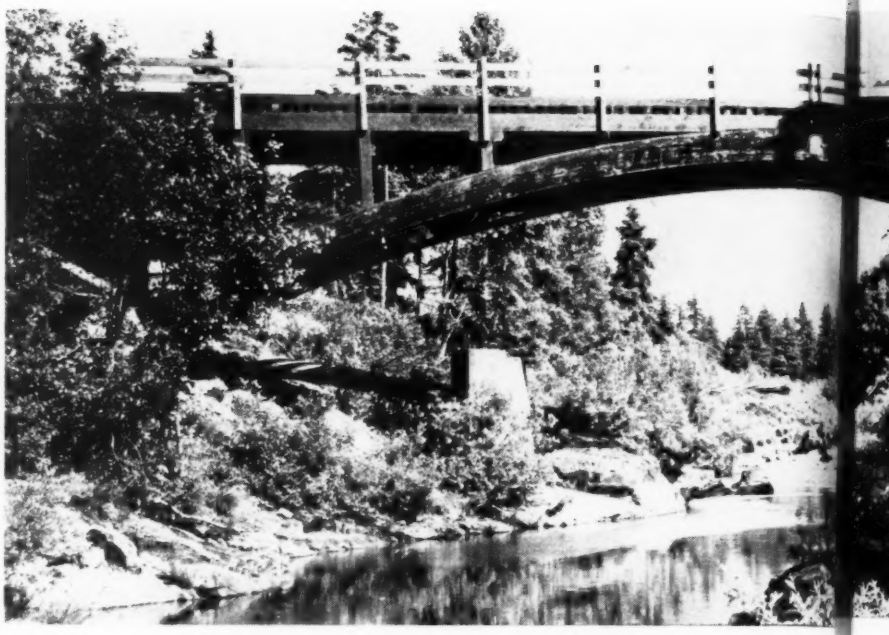
Architectural effects not possible with solid timber. Arches and

This article is based on an address read before the recent convention of the American Railway Engineering Association at Chicago.

curved beams of large cross section, which are not possible with solid timber, lend themselves to a variety of architectural treatments and thus broaden the possible scope of application.

The possibility of designing constant-strength members. In designing with laminated wood, it is possible to vary the cross section of the member to fit, more or less exactly, the varying stress requirements at different points.

There are a number of other factors that must be considered in comparing laminated with solid members. The cost of a laminated member is greater than that of a solid member because of the procedures involved in preparing the lumber and in constructing the member. The importance of the glue joint to the integrity of the member necessitates special equipment, facilities, and skills not needed to produce solid members. Also, large curved members may be difficult to ship by common carriers.



A timber arch bridge designed to carry a logging railroad and logging trucks .....

Advances in Adhesives

Engineers are frequently reluctant to accept structural members that depend on adhesives for their strength. This is probably due, in the main, to a lack of experience with modern adhesives. A building at the Forest Products Laboratory has, as roof supports, casein-glued arches that have been in service since 1934, with no sign of glue-joint deterioration. Actually, a number of casein-glued exterior structures have had long service lives in Europe. With modern waterproof adhesives of the resorcinol and phenol-resorcinol types now available, however, casein glue, which is water resistant but not waterproof, would not be recommended for exterior use or for any use in which the moisture content of the lumber is likely to go above about 20 per cent.

A question may well be raised as to the fatigue resistance of glued joints, particularly for railroad use. The evidence on this point is reassuring. A series of fatigue tests, including specimens tested in both shear along the glue joint and in tension perpendicular to the glue joint, produced no evidence that the glue joint tended to deteriorate due to fatigue any faster than the wood around it.

That glued laminated wood of adequate strength can be made has been demonstrated not only by laboratory tests, but also by the satisfactory service of laminated structures under a wide variety of uses during the past 15 years or so in the United States and, prior to that, during more than a quarter of a century in Europe.

Considerable data are available relating to the strength of glued laminated wood and the factors affecting strength. Laminated construction offers an advantage over solid timbers, because the position of knots and similar defects within a laminated member can be controlled, whereas, it cannot be controlled in a solid timber.

Consider, in this connection, the fact that a strength-reducing defect, such as a knot, must necessarily have less effect on strength if it is placed in a region of low stress, such as that near the neutral plane of a beam, than if it were placed in a region of high stress. Tests have confirmed that substantial amounts of relatively low-grade material can be placed in the central portion of a beam or arch without serious effect on the over-all strength. Thus, even though some of the laminations in a beam made of high-grade lumber are replaced by laminations of lower grade, it is possible to maintain a considerable proportion of the strength of the beam. Conversely, the strength of a beam of low-grade laminations can be improved by substituting a few high-grade laminations at the top and bottom of the beam.

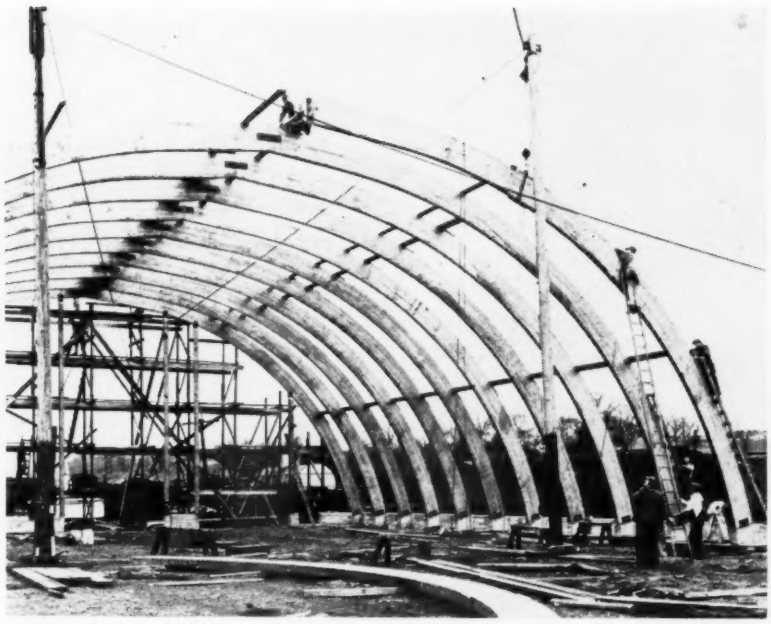
It is obviously unlikely that large knots will tend to concentrate at the critical section of a laminated member, and therefore the dispersion of defects in laminated members should have an advantageous effect on strength. Some proposed design procedures assign a more or less arbitrary evaluation to this effect. It is possible, however, with sufficient knowledge of the occurrence of knots within a grade, to establish mathematical estimates of this effect for members containing various numbers of laminations. Allowable design stresses computed in this manner are somewhat higher than for solid timbers of comparable grade. Cross-grain requirements, therefore, must be more rigid than for solid timbers in order to justify these allowable stresses.

Possible Railroad Uses

Obviously, it would be impractical to discuss or to illustrate all the possible applications of laminated wood on the railroads. A few, however, may be sufficient to indicate the prospects.

Figure 1 shows a trestle with laminated wood posts, caps, and stringers that has been in service on the Southern Railway System since 1945. The laminations generally are of southern yellow pine. The caps, however, are faced with three laminations of oak to impart greater bearing strength. All members were creosoted after manu-

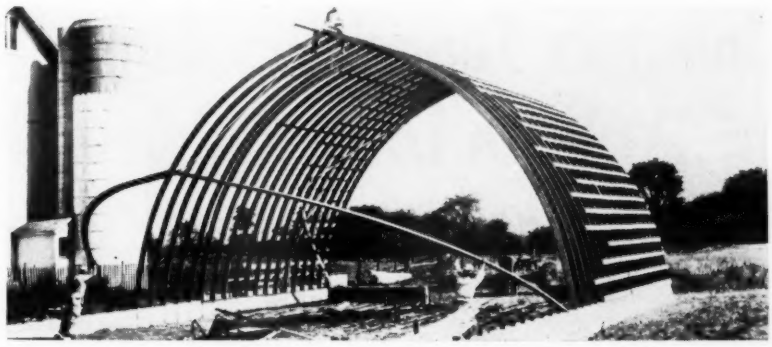
.....The arches are 117 ft. in length



These timber arches supporting the roof of an enginehouse have a span of 80 ft.

facture. This trestle, together with similar installations on a number of railroads, was reported a year ago to be in excellent condition.

The application of laminated wood, however, need not be limited to trestles. Figure 2 illustrates a bridge supported by four 117-ft. laminated arches. This bridge, which was designed for Cooper's E-50 loading, also carries heavily loaded logging trucks. The arches were creosoted after they were glued. Treatment of the laminations prior to gluing is sometimes necessary if the size and form of the member make it impractical to treat it in its finished form. Investigations are now under way that seek to make practical the gluing of creosoted laminations.



Glued, laminated timber rafters being erected to support the roof of a farm building

Large Buildings

Figure 3 illustrates an enginehouse of the Minneapolis & St. Louis at Peoria, Ill. The heavy laminated arches, of 80-ft. span, provide a post-free interior and fire-resistant roof supports adaptable to any required roof form. Such arches could be used as the roof supports of large, as well as small, station buildings.

Laminated wood rafters of the type now in common use in farm buildings would serve admirably for many small railroad buildings. Shops, storehouses, section buildings, and the like could be easily adapted from the type of building shown in Figure 4. Buildings of this general type may all but be bought "off the shelf" from manufacturers of rafters for farm buildings. A variety of forms and spans are more or less standardized by several manufacturers.

The wearing characteristics of ties may be improved by incorporating hardwood laminations on the surface, thus combining the superior mechanical resistance of hardwoods with the lower cost of softwoods. The Forest Products Laboratories of Canada have obtained encouraging results from a study of such composite ties.

A number of European countries have used laminated members as roof supports for platform shelters, the supports combining the post and the supporting members in one piece. The one-piece construction is easy to erect and offers an improved and varied appearance, as compared with framed supports of solid members.

Summary

Glued laminated wood has already demonstrated its usefulness and versatility in many and varied applications. Basic information for design is available, and competent fabricators are available to manufacture glued laminated wood and, if necessary, to furnish designs. Thus, glued laminated wood is ready, willing, and able to serve the railroads well. Its application to their needs will increase as its qualities become more apparent. It is hoped that this brief presentation has given you a better insight into the possibilities.

After new rails had been installed, ties were renewed out-of-face and rubber pads applied above and below the tie plates

Counters Tunnel Problem With Long Rails, Rubber Pads

Central of Georgia tries out new butt-welded rails with rubber pads placed above and below the tie plates in two tunnels in an effort to lick the problem of corrosion and excessive mechanical wear of ties.

• Because track maintenance in the Oak Mountain and Coosa Mountain tunnels of the Central of Georgia, which are located 2.7 mi. apart near Leeds, Ala., had for a long time been absorbing an excessive number of maintenance dollars, this road set about devising ways to bring these costs more in line with what they should be.

For one thing, the chemical action of locomotive gases, coupled with the dampness within the tunnels, caused rapid and excessive corrosion of the rails, rail joints, tie plates, rail anchors and spikes. Up until 1930 the average life of the rail and fastenings in these tunnels was approximately three years. But in that year butt-welded rails were laid through the tunnels, with the result that the service life of the rails was more than doubled; renewals since that time have been made on an average of every seven years.

Another problem was presented by the relatively short service life of crossties installed in the tunnels. Due principally to mechanical wear in the tie-plate areas it was necessary to renew the ties out-of-face every 14 years.

With the object of minimizing corrosion of the rails and tie plates (much of which was suspected to be of electrolytic origin) and of reducing mechanical wear of the ties, the railroad decided to experiment with the use of rubber pads, placed between the rails and the tie plates and between the tie plates and the ties. The rubber pads, which are of a special design, are described in detail in the accompanying separate article.

The installation of rubber pads was made late last year in connection with the renewal of the butt-welded rails in both tunnels and the out-of-face renewal of the ties. The principal reason for renewing the rails in 1951 was the occurence of many incipient hend-and-web separations; more than 30 such fractures were found by the Sperry detector car in a test made just prior to the laying of the new welded rails.

For butt-welding the rails, an Oxweld pressure-welding plant was established between the tunnels, the site being about two miles from the Oak Mountain tunnel and 0.7 mi. from the Coosa Mountain tunnel. The latter tunnel is 2,431 ft. in length. For this tunnel four strings of rails, each 1,404 ft. long, were produced, which were closure-welded after installation to provide 2,808 track-feet of welded rail. For the Oak Mountain tunnel, which is 1,198 ft. in length, two strings of rail, each 1,287 ft. long, were installed.

Each string of welded rail was transported to the point of installation by fastening a chain to one end and using a locomotive to drag it along the track. The old rail was then removed and the new welded strings were moved into place with lining bars. After the new rail, laid on new double-shoulder tie plates,

had been installed the old ties were renewed out-of-face. In this operation Anchor-Seal tie pads were placed beneath the tie plates and the Rail-Abrasion pads were placed between the tie plates and the rails. The rubber pads were installed throughout the lengths of both tunnels. In the longer tunnel, the two lengths of rail on each side were closure-welded by the two-torch conventional hand method after they were in position. The rails were anchored by applying Improved Fair anchors at the rate of 8 per 39 ft. rail.

This work was done under the general direction of H. G. Carter, chief engineer of the Central of Georgia.

After pressure welding, each string of welded rail was dragged to the tunnel site

The Rubber Pads Described

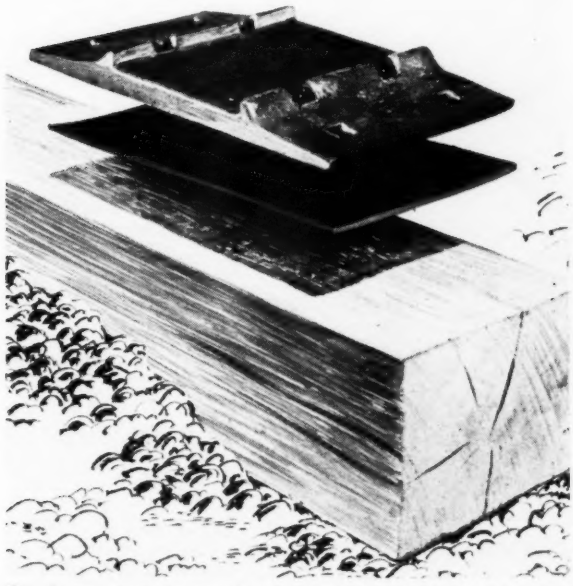
The rubber pads that were installed in the Oak Mountain and Coosa Mountain tunnels of the Central of Georgia are a product of the Railroad Rubber Products Corporation, Ashtabula, Ohio. They are compounded of natural rubber and were moulded to the desired shapes, then punched to fit the rails, plates and spikes with which they were to be applied. They are designed to withstand, distribute and cushion impact loads, to reduce abrasion, tie wear, corrosion, and rail fracture, to eliminate electrolysis, and to stabilize the gage and level of the track.

As stated in the article two types of rubber pads were installed, which were used in combination with each other. These are known as the Anchor-Seal tie pad and the Rail Abrasion pad. The Anchor-Seal tie pad is applied between the tie plate and the tie, while the Rail-Abrasion pad is inserted between the tie plate and the rail.

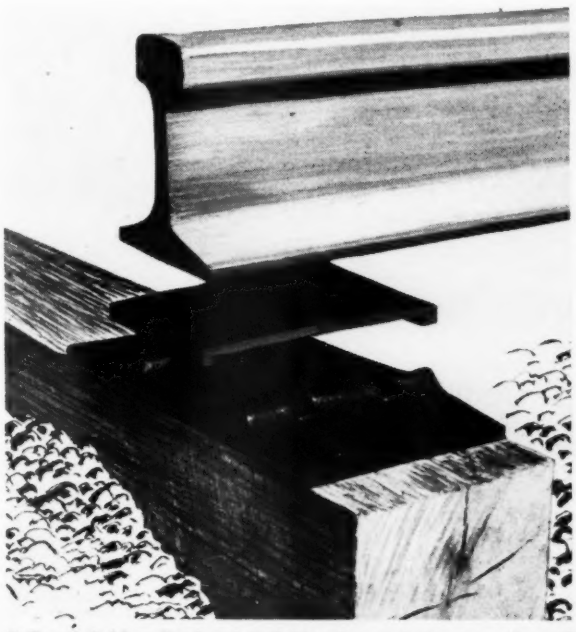
Details of the Anchor-Seal Pad

The Anchor-Seal tie pad is an all-rubber flat pad that is manufactured in several thicknesses, each for a specific use in track application. These thicknesses are $\frac{1}{8}$ in., $\frac{3}{16}$ in., $\frac{1}{4}$ in. and $\frac{3}{8}$ in. The heavier pads are intended for use on ties supported by solid or rigid structures such as bridges, tunnels, trestles and concrete slabs. The pads are available in sizes to provide full coverage under any standard steel tie plate. Their top and bottom surfaces have self-bonding, self-anchoring treads for firm adherence to both the plates and the ties. Hence it is claimed that the pads provide resistance against lateral movement, in addition to sealing out destructive liquids, grit and water.

The Rail-Abrasion pad is an all-rubber pad and has a shoulder appendage, $\frac{3}{8}$-in. by $\frac{3}{8}$-in. in section, at each side that snugly fits the side of the rail seat of the tie plate, thus securing the pad in a permanent position. It is manufactured in thicknesses ranging from $\frac{1}{8}$ in. to $\frac{3}{16}$ in. The function of this pad is to cushion the impacts from rail loads as well as to eliminate or minimize electrolysis, corrosion, abrasion, and fractures, and to reduce noise, vibration, flow and batter of the rails.



The Anchor-Seal tie pad has been designed with self-bonding treads on its upper and lower surfaces which, the manufacturer points out, anchor the tie plates more firmly to the ties



Railroad Rubber Products' Rail-Abrasion pad fits over the rail seat of the tie plate in such a manner that the end shoulders of the pad come in contact with the edges of the tie plate

Earthward bound is this one-time indispensable structure, now obsoleted by the introduction of diesel-powered locomotives

Structural members were taken away first

A clamshell-equipped Hydrocrane salvaged about 10 tons of coal from the debris

Casualties of Dieselization...

Coal Chutes, Water Tanks Bite the Dust

• The quiet of the countryside near McIntire, Iowa, 64 miles north of Oelwein, was shattered one afternoon last summer as a 65-ft. steel coal chute fell to earth with a crash. Before the work was completed, scenes such as this occurred in a total of some 35 Illinois, Iowa and Minnesota communities along the Chicago Great Western. Thus the Great Western was disposing of facilities that had been rendered obsolete by the complete dieselization of its motive power.

The dismantling work, which began about the middle of 1950, was done by the Jacobson Steel & Supply Co., Dubuque, Iowa. A crew of four men, equipped with acetylene torches, saws and a truck-mounted Bucyrus-Erie Hydrocrane, was assigned to the job. The Jacobson Company recovered 25 to 35 tons of scrap iron and steel from each of the metal towers and chutes.

Typical of the procedure used in the dismantling project was the operation at McIntire, where the steel coal chute and a wood water tub were to be felled. As a preparatory step the crew foreman checked train schedules with the yardmaster because the 65-ft. coal chute, first to fall, was to be dropped across a main line and a siding. With the timing established so as not to interfere with traffic a cable was connected from the top of the structure to the truck on which the hydraulic crane was mounted, and two men with torches cut the two steel columns supporting one side of the chute. Next, while the truck took up the slack in the cable, the bolts which held the other two supporting columns to their concrete bases were cut, causing the chute to topple over.

When the dust had settled the structural members were cut into sections for convenient handling and the ¼-in. sheets of steel which formed the hopper part of the structure were also cut into pieces. As the pieces were cut free they were stockpiled by the crane. When the first sheets were cut from the hopper, more than 10 tons of coal were found inside, which apparently had been jammed in the throat of the hopper. To remove the coal so that the torches could be used safely on the remainder of the hopper plates, a ⅝-yd. hydraulic clamshell bucket was attached to the crane. With dismantling completed and the scrap piled beside the tracks, a gondola was spotted beside the pile and the crane was used to load the scrap an operation that was performed in about an hour.

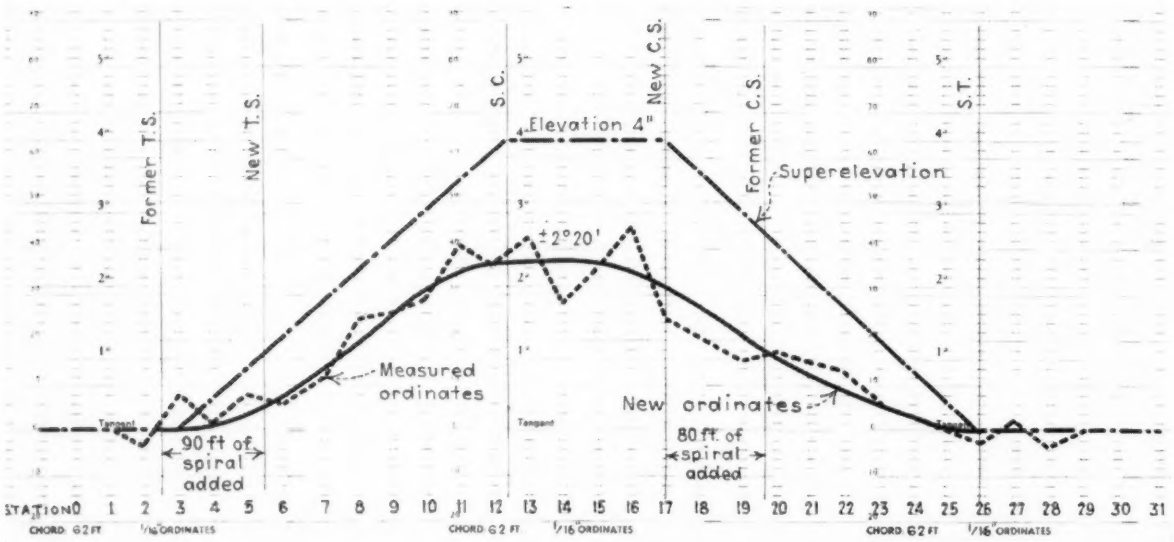
The 35-ft. wood water tub was next. The roof was removed first, after which the side staves were sawed off and dropped to the ground. The supporting timbers were then pulled over, sawed into lengths which could be handled easily and loaded by the crane. All lumber suitable for reuse was shipped to saw mills for resawing.

The most work at a single location was done at Sycamore, Ill., where a steel water treating tank, an 85-ft. coal chute and a turntable were scrapped. So as not to damage the sheet steel of the coal chute more than necessary this structure was dismantled from the top down. The procedure was to cut a hole in each plate at a riveted joint so that the plate could be supported by the crane hook while it was being cut free.

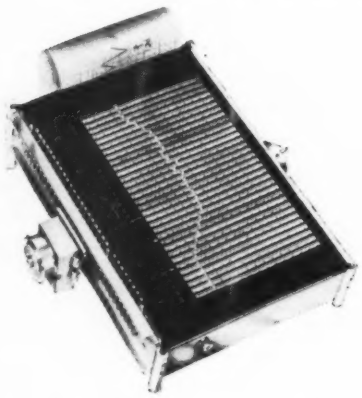
How One Road Has Mechanized

Describes field and office procedure involved in using a recently developed machine designed to simplify the necessary calculations.

Using Curveliner in trunk compartment



This graph, a reproduction of an actual Curveliner Record Sheet, shows the manner in which curve records are prepared. The solid line depicts the diagram traced from the position of the pointers after "smoothing out" the original diagram (dotted line)



Details of the Curveliner and Its Accessories

The Curveliner is a device which mechanically performs the calculations necessary in stringlining railroad curves. This machine, which mechanically employs the principles of partial differentiation, consists basically of a series of movable pointers which move along parallel graduated scales. These pointers are moved by a small crank on the right side of the machine through a sliding gear box which is mounted on the left side.

In using the Curveliner, the ordinates of the curve as measured in the field are plotted on the machine by moving the pointers until each is set at the proper value. There is a pointer for each station of the curve. Then, by engaging the sliding gear box at the proper station, and turning the crank, the pointer for this station can be made to move. The pointers for the two adjacent stations will also move, but in the opposite direction and at one-half the rate of speed. This fulfills the terms of the stringlining rule which states that a throw at any station will produce at the two adjacent stations a change in the ordinates equal to one-half the throw and of opposite sign to it.

On the left side of the face of the Curveliner is located a series of keys, one for each station, by means of which the mechanism for a particular station may be locked. Pointers are locked in this manner whenever conditions are such that no throw can be permitted at a station, i.e., locations of bridges, road crossings, etc. Also on the left side of the machine are the throw indicators. These devices indicate numerically the magnitude and direction of the resultant throws. When the original ordinate diagram is being set on the machine, a portion of the gear mechanism in the sliding gear box is disengaged by turning a small knob, so that the throw indicators are not affected by the movement of the pointers. Then, when the ordinates have all been entered, the throw indicators are set to zero and reengaged so that they will register any movement of the pointers.

The operator then proceeds to smooth out the ordinates until the desired solution is reached. This he does by setting the sliding gear box at the various stations and turning the crank. The pointer for a particular station at which the gear box is set will move to the right or left, depending on the movement of the crank, and the throws will be concurrently indicated for each station as the pointer for that station is moved.

It is claimed that the operator can arrive at the most suitable solution in accordance with the conditions of the track, which he has noted on the machine since he has constant control of both throws and ordinates. Before and after performing the computations the operator traces the ordinate diagram on a sheet of specially graduated paper which is supplied with the machine and which is held on a roll at the rear of the Curveliner.

The Ordinator Kit

Also available for use with the Curveliner is a kit which contains the equipment necessary for measuring ordinates.

Its Stringlining Work

• A device, known as the Curveliner, which calculates the "throws" necessary to bring track into the desired alinement was recently acquired and put to use on the Illinois Central. A detailed description of the Curveliner is presented below on these pages, along with descriptions of several devices designed for use with it.

The machine was purchased and put in service in May 1951. Immediately after it had been received a demonstration was arranged at Chicago, which was attended by engineering representatives of the road's divisions in the northern territory. At this meeting the men were not only shown how the machine is used in actual practice to calculate throws but were also given an opportunity to try their skill at operating the device.

The machine was first assigned for use in the Chicago area where it was used until August 1951, a period of approximately three months, in lining approximately 50 curves. The results included a considerable saving in the amount of engineering time required to do the work, especially on those curves where rigid limits had to be observed, such as at the locations of signal bridges, where the amount that the track could be "thrown" was limited by the allowable clearances.

Whereas normal usage would call for transporting the unit out to the job and performing the computations in the field in order to realize the full benefits of its calculating speed, this procedure was found to be unnecessary in the Chicago area since the division headquarters could be easily reached in an hour's time from any location on the territory. Therefore, the machine was kept in the office and all computations were performed there. Stations were laid out and ordinates measured one day prior to the lining of the track, and the data collected was returned to the office for processing.

Calculating the Throws

The stringline data collected in the field were taken to the office and set on the Curveliner. From the first setting an irregular diagram representing the ordinates was obtained, which, again using the machine, was modified to obtain a better line. The alinement thus obtained was considered to be, economically, the best obtainable on the particular curve being lined. Locations where throws were restricted were noted and care was taken to keep within the prescribed limits at those stations. The resultant throws and any necessary changes in curve elevation were written on a curve record sheet along with the "before and after" ordinate diagrams as traced from the indicator pattern on the Curveliner. The throws, elevations, etc., were also recorded in a field book for use by the field party. Throwmeters for use with the Curveliner were not delivered to the road until early part of August just prior to the time that the Curveliner was sent to another division. Hence, they were not used to any appreciable extent in the Chicago area, a scratch board being employed instead.

Employed on Other Divisions

The Curveliner was sent to another division in northern territory on August 17, 1951, where it was used until November of that year. It was then transferred to southern territory where it could be used to good advantage during the winter

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In this kit are included two devices, one known as the Ordinator and the other as the Ordinator Scale.

The Ordinator consists of a length of special nylon-encased seven-strand stainless-steel wire, secured at each end to an aluminum handle. The handles are so constructed as to afford a positive grip and to serve as reels upon which the wire may be wound when not in use. In addition, these handles are so designed as to fit securely against, and maintain the wire ends 1 in. from, the head of the rail.

The Ordinator Scale, which also may be used as a slide rule, contains various units of linear measure on one side, and standard sliderule scales on the other. With this device, ordinates may be measured in any of the more common units desired.

Throwmeter Kit

Another accessory that is available for use with the Curveliner, and which is brought into use during the actual operation of throwing the track to the desired position, is the Throwmeter. Throwmeters are supplied four to a kit and are furnished with a sturdy steel carrying case. Each Throwmeter consists of a heavy base which is designed to rest securely in the ballast, a graduated dial attached to the top surface of the base, and a pointer which is attached to a vertical shaft extending upward from the base. A string is wound around a spool on the upper portion of the shaft and is secured to the tie by means of a special tack. Any movement of the tie causes the spool to rotate, which in turn causes the pointer to indicate upon the scale the magnitude of the movement. The preferred procedure is to first set the dial so that the pointer indicates the desired throw, after which the lining gang shifts the track until the pointer registers zero.

Shown here are the various devices for use with the Curveliner. Left—the Ordinator, with a spare wire wound on one of its two aluminum handles. Center—the Ordinator Scale. Right—the Throwmeter attached to a tie and in position to indicate a throw

The Throwmeter is first set to indicate the desired throw and the lining gang then watches the dial on the meter and shifts the track until the pointer indicates zero

time. The general procedure followed in this territory was fundamentally the same as that previously described, with two exceptions. First, since division headquarters were not usually convenient to the locations being worked, it was found necessary to take the Curveliner into the field. On at least one occasion, the machine was set up and operated from the trunk compartment of an automobile. It was discovered that the taking of data and the computation of throws could easily be accomplished at a rate that enabled these operations to keep well ahead of the lining gang.

Throwmeters Used

The second major deviation from earlier practice was that the Throwmeters were put to extensive use for the first time, eliminating use of the scratch board or the necessity for driving stakes. With these devices the lining operation was carried out in the following manner: The throws were indicated as to direction and magnitude by chalk marks on a tie. A Throwmeter was then placed in the ballast at the station to be lined and the cord attached to a tack driven in the nearest tie. The indicating scale on the meter was rotated to indicate the desired throw so that, when lining, the men had only to note when the pointer reached zero. When the lining gang came to the station the men would group themselves about the meter and throw the track the correct amount as indicated by the dial. The gang would then move on to the next station where another Throwmeter had been placed. Meanwhile, the Throwmeter at the previous station was removed and placed four stations ahead. A full kit of four meters was employed which permitted them to be placed well ahead of the gang.

It was found after a few attempts that the men in the gang were able to throw the track without the foreman's continuous direction, by merely watching the indicator on the meter at each station. This permitted the foreman to devote part of the time to examination of the general alinement and to make minor corrections at intermediate points, when required, before the gang had moved more than several stations beyond.

Program Yet to be Set Up

As mentioned before, the Curveliner method of lining curves is as yet still in the early stages of development on this particular road, and no definite program for its use has been established. The present practice, however, is to have the machine assigned to the northern territory during the summer time and the southern territory during the winter time. It is planned to acquire additional machines over a period of time so that this method of curve lining may be more generally used.

A full kit of four Throwmeters permits their placement well ahead of the lining gang

No Happy Ending...

Tough Problem Presented By Bad Water from Deep Well

By Walter D. Gibson
Water Service Engineer
Chicago, Burlington & Quincy
Chicago

• This is an account of a series of measures that were taken to find out why the quality of the water from a deep well suddenly failed and, if possible, to correct the trouble. Although it must be recorded that the attempts to solve the problem were unsuccessful the description of the procedure followed is revealing because it brings out some of the steps that can be taken in such instances—steps that conceivably could lead to success if the situation were not fundamentally irreparable.

Gillette, Wyo., is an intermediate engine terminal on the Sheridan division of the Burlington, which extends from Edgemont, S.D., to Billings, Mont. The line is partially dieselized in that the one passenger train and the regular time freight train in each direction are diesel operated, but steam power is needed for extra and local trains and some helper engine service.

Always a Problem

The water problem at Gillette has always been very acute. Originally the water was obtained from an impounding reservoir, but for various reasons this supply eventually failed. In the late 1930's an investigation determined that there was a meager supply of water of fairly good quality in a thin stratum of sand rock located at a depth of between 800 and 850 ft. A well was drilled and a submersible-motor type pump was installed, which furnished about 35 g.p.m. of water. After a few months pumping the sand stone in the waterbearing formation deteriorated very badly, causing the well to pump large quantities of fine sand which caused much damage to the pump and motor.

In an attempt to correct the sand difficulties, the well was cleaned out, a fine-mesh screen was installed through the sand stone, and the annular space between the screen and the well wall was packed with graded gravel. This was quite effective in stopping the inflow of sand.

Increased traffic during the early stages of World War II made another well necessary. It was drilled about 1,000 ft. from the No. 1 well by the rotary method, using a 20-in. hole inside of which was placed a 16 in. standard welded steel casing to a depth of about 700 ft. The annular space between the 16-in. pipe and the well wall was pressure-cemented from the bottom, insuring a 2-in. thick cement lining in addition to the casing. Below the 16-in. casing the hole was undermined to a diameter of 36 in. and a depth of 850 ft. A 10-in. fine-mesh screen was installed and the hole gravel packed.

No. 1 Well Fails

At about the time the No. 2 well was finished, the quality of water in the No. 1 well began to fail and soon became so bad it was necessary to discontinue its use. War traffic was still heavy and it was necessary to provide a third well which was constructed in the same manner as was No. 2 but in the opposite direction and about 1500 ft. from the No. 1 well.

All of these wells produced methane gas in varying quantities, indicating the possible existance of oil in the area. Also, several seams of coal were encountered when drilling them. These factors, when considered in retrospect, make it seem unusual that a satisfactory underground supply of water could be obtained and are probably the underlying cause of the failure in the quality of the supply.

About 2½ years ago the water in No. 2 well suddenly became unfit for use. A de-ionizing plant had been installed to supply boiler water for the heating plants on the diesel passenger engines. To operate efficiently and economically these plants must have a raw-water supply of reasonably good quality. To insure this it was necessary to conserve the supply from the one remaining good well (No. 3). To this end all steam engines were provided with auxiliary tanks and got their supply of water elsewhere.

There was a diversity of opinion regarding the cause of the quality failure at the No. 2 well. One contention was that it was simply the result of exhaustion of the limited supply in the formation and the infiltration of bad water from higher formations, perhaps abetted by gas pressure, etc. Another opinion was that an opening had developed in the casing of the well, allowing bad water to enter from above.

In view of the fact that a new well would cost about $35,000, it was considered advisable to explore every known means of rehabilitating the well. The first operation was to determine if the bad water in No. 1 well was communicating through the lower formation to No. 2 well. A quantity of a green dye known as Flourescein was placed in No. 1 well, after which the pump on No. 2 well was operated continuously for several days at its highest capacity. However, no trace of the dye was detected in the discharge.

"Spinner" Test Made

The next step was to make a test with a Dowell "spinner" which, as its name implies, is a sensitive rotating device which is lowered into a well on an electric cable. It will rotate in either direction when activated by any flow of water. The rapidity of rotation, denoting the amount of water flow, is indicated on a gauge at the surface. Water was pumped into the well at the surface and the resulting indication on the gauge was that a considerable quantity of water was leaving the well at a depth between 115 and 145 ft. This seemed to confirm the opinion that there was a hole in the casing which, when the water in the well receded to its normal level, would permit water to enter instead of leave the well.

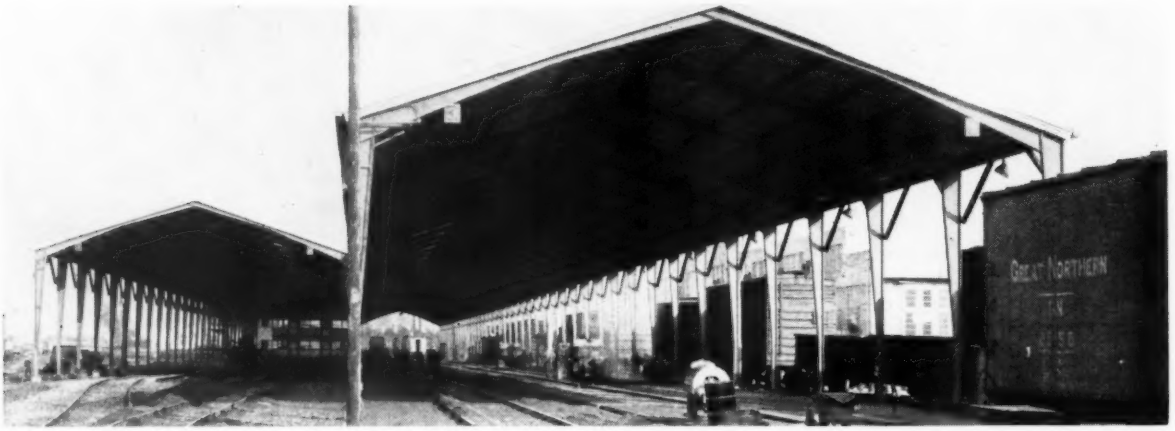
To pursue this phase of the situation to a conclusion, it was decided to run about 180-ft. of new 12-in. liner pipe into the well with a well-wall packer which, when set at a predetermined level, could be expanded to seal off all the area above it. This was done and tests were made as to the effectiveness of the seal, which was found to be tight.

The pump was reinstalled and a pumping test of several days' duration was made. The quality of the water was still very bad. It was concluded that the bad water had permeated the formation; as a result the well has been abandoned.

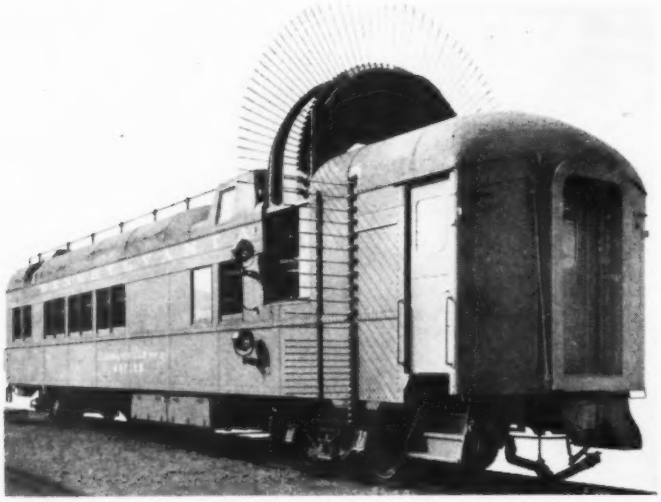
VIEW from the south balcony of the Coliseum in Chicago showing a portion of the extensive products exhibit sponsored by the National Railway Appliances Association during the A.R.E.A. convention, March 11-13

BELOW—Visitors at the booth of the Matisa Equipment Corporation at the N.R.A.A. exhibit had a chance to win a Swiss stainless steel chronograph wrist watch by guessing the number of pieces of slag ballast in this 1½-cu. ft. jar. Correct answer, 828. Winner, with guess of 825, was W. F. Smock, construction engineer, Chicago Great Western, Oelwein, Iowa

News Briefs in Pictures . . .



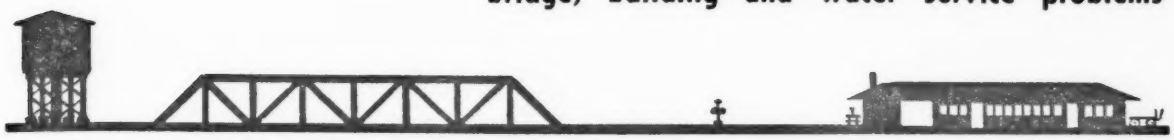
ABOVE—Carmen of the S.P.&S. at Vancouver, Wash., now have conditions and facilities for the repairing of freight cars in this rip-track shelter that are far superior to those formerly used. Each of the two bays of the rigid-frame shelter has a clear span over two tracks and allows ample working room on both sides of bad-order cars as well as overhead. Roof consists of corrugated aluminum sheets. Skylights of corrugated plastic in the roof over the inside tracks augment the daylight entering through the open sides. Has many service outlets



LEFT—Increased traffic at higher speeds made it necessary for the Pennsylvania to develop a new clearance car capable of measuring clearances of structures with greater speed and accuracy than was possible with the former car used for this purpose. Built in 1950, the new car has four sets of feeler templates designed to measure anywhere from 6 in. to 21 ft. above the tops of the rails. While it is measuring clearances of a structure, the car is operated in a work train at a speed of about 5 m.p.h.; speed is then increased between structures

WHAT'S THE ANSWER?

An open forum for maintenance men on track, bridge, building and water service problems



How to Distribute Ballast Economically

When ties are being renewed ahead of an on-track tamping machine, what is the most economical way of assuring the proper distribution of new ballast? Explain.

No Push-Car Trucking

By W. E. Cornell
Engineer of Track
New York, Chicago & St. Louis
Cleveland, Ohio

We formerly had ratchet controls on our hopper cars by which we were able to exercise some control over the distribution of ballast, especially with the added assistance of ballast boards. With other types of hopper cars, ratchet hoists and chains aided by ballast boards, enable us to control very accurately the amount of ballast distributed. With the rachet hoist we can increase or decrease the amount of ballast as desired.

It seems rather obvious that at present labor rates, it is uneconomical to do very much, if any, push-car trucking for the distribution of ballast.

Use Tie-Renewal Machines

By R. H. Beeder
Assistant Chief Engineer System
Atchison, Topeka & Santa Fe
Chicago

The proper distribution of ballast ahead of a surfacing gang renewing ties should not be basically different whether the gang uses an on-track tamping machine or off-track tamping equipment. The use of selective-type ballast cars with longitudinal hoppers under the direction of an experienced work-train foreman is of primary importance, unless one undertakes a lot of expensive double handling, such as can result through the indiscriminate use of side-dump hopper cars.

By careful observation of grade stakes, from which he can estimate the raise, the work-train foreman can regulate the center and side dumping as the work progresses so that just enough ballast, and no more, is dropped to surface the track properly. When correctly done, the ties can be spaced and necessary tie renewals made behind the jacking operation. After the tamping is accomplished, a second dumping of ballast is made to fill the cribs to the proper elevation and fill out the ballast shoulders for spotting and dressing. Any inequalities in this second dumping can then be smoothed out to eliminate hand work by an on-track ballast drainage car equipped with a center plow and box dressing wings as well as with frayed cable rotary brushes.

Directly related to this question is the apparent lack of economy in renewing ties directly ahead of tamping equipment, regardless of the ballast distribution, as tie renewals ordinarily vary from possibly 50 per mile to more than 1000 per mile. The gang must be organized with correct personnel to handle these renewals at an estimated average or normal rate. When the work enters a stretch where renewals are heavier than normal, the gang is undermanned and the production of the equipment suffers. Conversely, the gang is overmanned where renewals are lighter than normal. The solution is the development and use of tie-renewal machines capable of ac-

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Answers to the following questions are solicited from readers. They should be addressed to the What's the Answer editor, *Railway Engineering and Maintenance*, 79 W. Monroe St., Chicago 3, and reach him at least 30 days in advance of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

To Be Answered In the July Issue

1. What precautions are necessary for the safe handling of oxygen and acetylene cylinders when used for maintenance work? Other equipment used in gas welding and cutting? Explain.

2. Can plywood be given fire-retardant treatment? How? If so, what possible applications would such fire-resistant plywood have on the railways? Explain.

3. To what extent is a high standard of track maintenance in yards essential? Explain. How can it be accomplished?

4. To assure economical and effective work, what mechanized tools and equipment should be assigned permanently to local bridge and building maintenance crews? Explain.

5. To what extent is it desirable to buff the bolt holes, as well as the ends, of new rails to remove stress-raising burrs? How effective is this practice in reducing rail failures within the limits of the joint bars? Explain.

6. To what extent, if any, do diesel oil-pumping stations require explosion proof motors, switches and vapor-proof lights?

complishing this job at a reasonable cost well in advance of the entire surfacing operation, thereby relegating the exact distribution of ballast to a somewhat less important position.

New Machine Does It

By John P. Hiltz, Jr.
Engineer Maintenance of Way
Delaware, Lackawanna & Western
Scranton, Pa.

Soon after the receipt of our automatic tamping machines, we found that we were realizing almost unbelievable savings when using these machines in making a 1-in. to a 1½-in. surface raise without tie renewals. At the same time, however, we found that there was little, if any, economy in using the machines in connection with a tie-renewal raise. We quickly determined that the reason for this latter finding rested in the distribution of ballast.

For many years prior to the advent of automatic tamping machines we had used the so-called "detour" system of making a tie-renewal raise. This involved the absolute use of the track during working hours and the use of a large gang to complete an average of a mile of track per day. With this system we tamped the track with pneumatic tampers, using a specially modified tamping bar with a 1-in. by 6-in. face, and dragged our ballast to fill in the track after the day's work was completed. In thus performing the work we used 16 men on tamping guns and 8 men nipping ties and adjusting ballast, or a total of 24 men on the tamping operation.

When the tamping machine was installed in this organization we found that it required more ballast and more accurately placed ballast for good tamping and that it was, therefore, impractical to drag ballast behind the tamping operation. Likewise, it was impractical to drag ballast between the tie-renewal operation and the tamping work. As a result, we were forced to drag ballast ahead of the tie-renewal operation and the tamping work. In doing this, we soon found that if we distributed an adequate amount of ballast to the right places to accommodate the tamper, we appreciably retarded our tie-renewal operation and thereby required additional labor to pull spikes, remove ties, clean out tie spaces, install and space ties, etc. After much experimentation, we compromised on a light drag throughout the length of the tie and a "finish" drag from side-dump cars at the ends of the ties. With this compromise, we found our force at the tamper consisted of two machine operators, two men nipping ties, two men at the tie tamper feeding ballast, and from 15 to 20 men ahead throwing in ballast and adjusting it, depending on the conditions existing at the particular location. The variable number of men required for this operation was particularly objectionable as it required us to shift our force constantly and prevented our establishing an equalized gang.

We were, therefore, not realizing much economy through the use of the tamper. However, we found that the machine was producing a much better tamping job than we had been getting previously and that, potentially, it allowed for increased production if we could solve the ballast-distribution problem.

Accordingly we developed a practice whereby we distributed practically all of our ballast in the "center-ditch" through the use of side-dump ballast cars. Necessarily, a small amount had to be distributed on the shoulder to balance the cars and to empty them. In addition, we made a very light hopper drag over the length of the tie. This practice kept practically all of the ballast out of the way of the tie-renewal operation. To get the ballast into the track where we wanted it, behind the tie-renewal operation and ahead of the tamper, we developed a self-propelled "conveyor-distributor" which picked up the windrow of ballast in the center ditch and discharged it into a specially constructed hopper mounted on a push truck. This hopper is equipped with discharge gates which are manually controlled and which are so situated that the ballast can be discharged into each individual tie crib at the locations most desirable for the tamping machine.

We have used this system for three years and for the tamping operation have now established a stabilized force, consisting of two machine operators, two men nipping ties, two men feeding ballast to the tamper, four men manually adjusting ballast and three men on the "conveyor-distributor." We now find that we are not only realizing labor economy through the use of the tamper but are getting better tamped track and more production than we did with the method of tamping previously used. We also find that the "conveyor-distributor" accelerates the "dressing" of the track and we have been able to realize further economies in that operation.

Install Ties First

By Ira W. Toy
Roadmaster
Soo Line
Drake, Minn.

The ballast distribution method depends upon the kind of "float" or raise you plan to give your track as well as the type of railway line being worked. If it is a branch line where the shoulder is high and drainage poor, it would only be necessary for a light spread of ballast between the rails, leaving the track high and well drained after the "float" is made and the ties placed. If the tie renewals are fairly heavy, I find the most economical way is to install your ties and fully spike them before the gravel is dumped. In this way, there will be no ties hanging down while making the raise. If the work is well organized and there is no long lapse of time between the tie renewals and the following operations, the ties could be replaced in a rather rough manner by spiking them securely but without much time spent in tamping them solid. When doing this type of work, a slow order must be placed on the track until after the raise is made.

If the work is on the main line, the ties should also be placed before the gravel is dumped so there will be no time lost in pulling spikes or hunting for tie plates or losing them in and around the new ballast or otherwise holding up the tamping machine while ties are being placed ahead of it. With new hydraulic tie removers and installers recently put on the market, it should be no trick at all to have the ties placed ahead of the tamping machine so that the track will not have to be molested after the raise is made.

For this type of work, the gravel should be dumped from multi-service cars. I always prefer to dump the ballast between the rails. Then you get an even spread, and there will be little or no necessity for equalizing the gravel behind the gang. The amount of lift you want determines the amount of gravel to unload.

What to Do with Old Trestle Piles

When renewing a pile trestle, should the piles in the old bents be pulled or cut off? Why? If the latter, at what point should they be cut? Why?

Cut Off, If Possible

By A. E. Bechtelheimer
Engineer of Bridges (Retired)
Chicago & North Western
Chicago

When previously driven piles must be renewed or removed the old piles should usually be cut off rather than pulled, for the following reasons: (1) It's the least expensive method of clearing the site; (2) in most instances it's not only the practical thing to do but also it's all that is necessary; (3) many instances can be cited wherein the stubs left in the ground have served as foundations for temporary bents of a replacement bridge after an emergency such as a burn-out; and (4) pulling piles is hazardous.

On the other hand, cutting piles off has at least one disadvantage in that the stubs left in the ground sometimes heave during freezing weather and eventually obstruct the waterway, requiring that they be cut off again at a lower level.

Sometimes the decision as to whether piles should be pulled or cut off will depend on the necessity for their removal. There are several reasons for removing piles: (1) To clear the site for a different type of construction; (2) to replace piles damaged in driving; (3) to clear the area for a different kind of pile in the same location, for instance, concrete or steel in place of timber; (4) to clear obstructions from the waterway; and (5) to effect economic gain by recovering piles.

In several of these situations, the piles must be pulled. The methods of doing that are too numerous to explain here, but suffice it to say, many of them are hazardous. It is for that reason, above all others, that I prefer to cut piles off—right at the ground line.

Pile Stubs Catch Drift

By James E. Becker
District Gang Foreman
St. Louis-San Francisco
Festus, Mo.

Where a pile trestle is being renewed, the old piling should be cut off as close to the surface of the ground as possible. I have had experiences with pile bridges at which old piling had been left standing for a distance of two to four feet above the ground. These stubs always caught drifting debris that was very costly to remove. Until it was removed it not only created a fire hazard, but sometimes dammed up the water until the force of the stream put a strain on the bridge. If the pile stubs do not catch drift they finally become dry and rotten and are apt to catch fire during periods of low water. Cutting them off close to the ground avoids a lot of bridge cleaning and is much safer.

Use of New Rail for Emergency Repairs

Under what conditions, if any, should new rail be used for replacing broken or defective rails in main track? What alternatives are acceptable? Explain.

Don't Use New Rail

By General Roadmaster

Track-maintenance men do not consider it good practice to replace broken or defective rails in main track with new rails, unless the present rail in track is comparatively new and there is no appreciable head wear. Even in the latter case it is preferable for the replacement rail to have been surface hardened by some cold rolling; otherwise, such practice only results in high-low joints. Even when the worn low rail is built up by welding it is not a very satisfactory job. It is much better when changing out broken or defective rails to replace them with good secondhand rail of the same section. After such rails have been changed, it is usually desirable to have the welder work over these joints to restore any difference in the height of the two rails by welding the low rail and grinding the joint to surface.

If it is not possible to furnish good secondhand rail and only new rail is available, the new rail should be laid out of face, preferably on tangent track, at a location where good secondhand rails can be recovered. Some of the recovered rails can then be used to replace the defective rails and the rest retained for emergency use.

Use Within Specific Limits

By Malcolm E. Condon
Construction Supervisor
Erie
Jersey City, N. J.

New rail should only be used to replace broken or defective rails in high-speed main track when such rail has less than ⅛ in. wear on the head, either the top or the gage side. For low-speed main tracks this can probably be increased to ¼ in., but in both instances, the rail ends should be carefully built up and the weld feathered out a sufficient distance to give a good riding condition.

When defective rails are worn beyond these limits, replacement should be made by using good, first-class relayer rail the height of which is as near as possible to that of the rails in the track so that the building up of rail ends can be kept to a minimum.

Excessive curve-wear creates a special problem, since the installation of a good relayer rail as a replacement creates an abrupt change in metal section on the gage side of the rails. This makes it necessary to apply welded metal at the ends of the adjacent worn rails, each side of the replacement rail, so the movement of the wheel flange from the worn rails to the replacement rail is as smooth as possible. This is particularly important on the high side of a curve. Under extreme conditions, it may even be necessary to relay the spiral of the curve entirely to release a rail (or rails) with comparable side wear to use as replacement for a defective rail with considerable side wear in the body of the curve.

Train speeds are of primary importance in deciding what care should be exercised in rail replacement. It is important that any re-

newal match as closely as possible the adjacent rails, to minimize the need for building up the surface or the gage side of adjacent rails.

Make Renewals in Stretches

By J. W. Diffenderfer
Supervisor of Track
Pennsylvania
Johnstown, Pa.

Essentially, a replacement rail should approach, as nearly as possible, the age and wear of the broken or defective rail being taken out of track. Except in emergency or other unusual situations, new rail should not be used to replace broken or defective rail in track unless it is done in long stretches, generally as a part of a rail-renewal program. Where only new rail is available, it should be laid in a continuous stretch, to obtain emergency rail of like wear and condition to the rail presently in track. The rail thus removed, would fit, without welding, any rail of the same section and wear and could be used as emergency rail wherever there have been similar traffic conditions, often without rail-end welding.

Only in an emergency where no other rail is available should an individual new rail be used to replace a broken or defective rail. It is thus undesirable to retain new rail for use on emergency rail rests or rail piles. Tread or flange-worn rail heads often present a section far different from that of the new rail and the rail-end welding thus required seriously affects the two adjacent rails, producing increased joint maintenance. When an emergency forces such replacement, it is desirable subsequently to lay a stretch of new rail at this location, to obtain additional emergency rail and avoid the adjacent heavily welded joints. Otherwise, the new rail should be removed as soon as possible where the need for such heavy welding is found to be apparent.

Keep Changing Repair Rails

By N. F. Alberts
General Track Foreman
Chicago, Milwaukee, St. Paul & Pacific
Chicago

I would not use a new rail to replace a broken or defective rail that had been in main track for five or six years except in case of derailment or other emergency. Rails retained in stock for emergency purposes must have nearly the same surface wear on the head as those in the track. To do this uniformly the few rails kept in stock for this purpose must be changed in and out of the track at least every two years. Replacing a single rail in main track after six or seven years of wheel action with a brand new rail always presents an unsatisfactory condition at the joints even when a smooth job of welding is done.

When a number of defective rails are found by a detector car in a number of different locations and only new rails are on hand or available for replacement, the new rail must be laid out of face in a stretch of track where the rails recovered will conform in surface wear with the defective rails to be removed. They can then be used to replace the defective rails found by the detector car.

Where a new frog or other piece of special trackwork, such as a railroad crossing, knuckle rail, or switch point is being installed to replace wornout materials, new adjoining rails should be installed to avoid damage to the other new materials. If the adjoining rails recovered are suitable they may be retained in stock for emergency use.

How to Reduce Leaks in Pipe Lines

How can leaks in water mains, air lines, and steam lines be curbed or reduced? Explain.

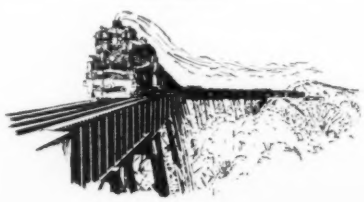
Good Maintenance Essential

By H. L. McMullin
Engineer Water Supply,
Texas & Pacific
Dallas, Tex.

Leaks in water, steam, or air lines occur through defective joints, worn, corroded or defective valves and seats, improperly maintained valve stems, and through holes in the piping caused by corrosion or accidental damage. Such leaks may be curbed or reduced by the judicious selection of the materials to be used, by correct design and installation, by utilization of appropriate anti-corrosion methods and last, but not least, by adequate maintenance.

After deciding what kind of metal or non-metal pipe is most suitable for the service intended, the selection of the proper class or weight of pipe must be made. These choices will be determined largely by the type of service intended and the location of the pipe, particularly with reference to the possibility of outside corrosive attack and to its accessibility for convenient maintenance.

Among other things, the design and installation of pipe lines should include consideration of the location of the line for early detection of leaks and accessibility for maintenance. Undetected leaks are probably the greatest offenders in this connection, and when we do finally locate one we often wish we had not because of the extreme difficulty in getting to it to make repairs. Of course, it is not possible to have all lines located for easy accessibility, but a lot of leaks could be avoided simply by taking full advantage of whatever conditions may exist which would afford greater accessibility.



By taking full advantage of appropriate anti-corrosion methods, many leaks may be prevented or postponed. These methods include various coatings, cathodic protection, and, of course, proper selection of pipe materials. The selection of method will depend upon the material used, the service intended, the corrosivity of the material being transported through the line, and, of course, the nature of the outside environment.

Adequate maintenance of water, air, and steam lines speaks for itself. Almost any line is subject to leaks. Adequate maintenance is required to stop those leaks that do occur and will prevent many before they occur. This latter statement is particularly true in reference to the maintenance of valves and pipe line supports.

Fills for Freighthouse Floors

What type of material should be used to make a fill on which a concrete freighthouse floor is to be placed? What methods should be used in placing the fill to secure a uniform support for the floor?

Super-Saturated Sand Best

By A. L Becker
Engineer of Structures
Missouri Pacific
St. Louis, Mo.

Some years ago we followed the practice of using clay fill, flushing it and tamping it mechanically or by hand. Despite care in placing and tamping, this type of fill did not prove entirely satisfactory because voids frequently developed due to failure of the fill to become fully consolidated.

In our opinion the best type of fill is sand. All perishable material should be removed from the area to be filled. Sand fill should be placed in fairly uniform layers and should be thoroughly flooded down with water to secure consolidation of the material. "Thoroughly flooded" is intended to mean the application of water in an amount at least 10 per cent beyond the saturation point of the sand. This, of course, necessitates that provision being made for draining off the excess water so the fill can dry out. Ordinarily we place the fill sufficiently in advance of the pouring of the slab to permit it to dry out. Immediately before pouring is started, we place roofing felts, preferably tarred felts, over the top of the sand fill. These serve a dual purpose: (1) They prevent the sand from absorbing moisture from the concrete when poured; and (2) they avoid wetting and bulking of the sand at the top of the fill. Where this has been done we have never observed the sweating of concrete floors at times of extreme temperature changes, whereas such sweating has been observed on some floors not placed in this way.

The foregoing method of making a fill on which to pour a floor slab is not recommended where the water table reaches ground level during certain seasons of the year. In such instances we consider reinforced suspended concrete slabs as being the best type of floor construction.

To Raise Out of Face or Spot Tamp?

What considerations determine whether a stretch of track should be given a light out-of-face raise or be spot tamped? Explain.

Must Raise, If Center Bound

By James H. Becker
District Gang Foreman
St. Louis-San Francisco
Festus, Mo.

The need for a track to be given a light out-of-face surface depends a lot on the condition the track is in. It is certainly needed if the track is out of cross level, causing trains to weave from one side to the other. Also, where a track is center bound, I would suggest a light surface job. But where a joint here and there is low, I think the best method is to spot tamp the track. In those circumstances, spot tamping will improve the "ride" and will not take as much time and will be much cheaper in labor and material.

Decide After Walking Track

By N. F. Alberts
General Track Foreman
Chicago, Milwaukee, St. Paul & Pacific
Chicago

A decision as to whether or not a stretch of track should be given an out-of-face raise to improve its riding quality, can be made only after consideration has been given to the condition of: (1) Surface; (2) alinement; (3) ties and (4) ballast. The best way to compare these factors is for the foreman and his supervisory officers to walk over the track. This inspection will determine the extent to which the surface and line have deteriorated, the number of ties in each panel requiring renewal, the condition of the ballast, etc.

If the track has become deplorable, spot tamping is merely a waste of time and effort. The same is true if the number of ties to be renewed are five or more to the track panel or the ballast has become dirty and worn out. Under such conditions it is best to give the track a general out-of-face raise of two to three inches using a spot board. At this time renew necessary ties during the raising operation, respace the ties to provide proper support of the rails, reset rail anchors, reline track, and apply additional ballast to dress the track to standard section. Where there is an accumulation of foreign material on the old ballast or where the joints are pumping because of wornout ballast, it is well to remove such material in advance of the surfacing operation.

While this method involves more labor and additional ballast, it is less expensive in the long run because the cost of tie renewals is greatly reduced. It also produces better over-all results. If grade or line stakes are not provided, a perfect job of raising and lining can be obtained by the use of Hayes lining and surfacing telescopes. The surfacing "scope" helps to locate the spot board at the best place to obtain a good running surface on the track. The lining "scope" aids in getting perfect alinement of the track.

On the other hand, if a stretch of track shows only spots of poor surface, minor irregularities in cross level, line kinks here and there, only a few bad ties per panel and the ballast is in fairly good condition, then the proper method is to renew the ties in advance of the spot-tamping operation by digging them in. After that, spot surface or "snipe" the track to correct irregularities of level, reline the track and trim up the ballast. This plan requires no ballast. Regardless of what method is used, all tamping must be done by power tampers of some sort, either unit or multiple.

Raise Only When Necessary

By John L. Dell
Track Supervisor, Baltimore & Ohio,
Garrett, Ind.

General riding conditions during the late winter and early spring months should be a great influence in determining whether track should be given an out-of-face raise during the following work season or whether spot surfacing

will suffice. With present heavy traffic, high cost of material and labor, and in some localities, a shortage of labor, out-of-face work should be deferred as long as good riding conditions can be maintained with spot surfacing.

Fouled ballast, pumping or center-bound track, poor crosstie conditions and improper tie spacing will all be reflected plainly when the frost leaves and during the wet spring months. Any one, or any combination of those conditions will justify or perhaps will require out-of-face work for correction. Under such circumstances, good riding conditions cannot be restored quickly or effectively with spot surfacing, which will render only temporary relief.

Depends Upon Three Factors

By J. W. Diffenderfer
Supervisor of Track
Pennsylvania
Johnstown, Pa.

Three major factors determine whether a stretch of track should be given a light out-of-face raise or be spot tamped. These are: (1) The present condition of the track and its locale; (2) the expenditures that can be afforded; and (3) the general maintenance policies of the railroad. Naturally, a stretch of track would have to need attention of some sort before such consideration would be given. The condition in which a track is permitted to exist before working it is interdependent upon the other two factors. On lines handling freight exclusively, a "safe" condition may be all that is required, while on roads handling mixed traffic, the degree of track-riding perfection desired must be made a matter of policy. The poorest piece of rolling stock will ride well on a perfectly maintained track. Few railroads, today, can afford to attain such perfection and operating officials, on that account, should require better riding qualities from rolling stock, so designed as to operate smoothly over track maintained at the minimum required for safety.

A second policy factor that must be considered before the other two major factors are discussed is the method of maintenance being used. Many roads have found it advisable to shift the heavy load of "working" tracks from the local section or extra gangs to heavy divisional, district, or regional maintenance gangs. Who is going to do the work and how it is going to be done are maintenance policies. Here, too, arises the question of whether to do the work by hand or by machine.

Whether a railroad is going to continue to raise track indefinitely would be the third policy factor. Continual raising, even by so-called "light" out-of-face raises, has created poor track profiles, decreased overhead clearances, seriously altered roadway cross-sections, required additional shoulder and berm material, and necessitated additional construction and raising of wingwalls, bridge walls, and retaining walls. Spot tamping will not involve these extra items, which must play a major part in the formulation of a maintenance policy.

Once the maintenance policies have been established, the condition of the track, the volume of traffic and the locale, must all be considered before choosing between spot tamping or raising. Track conditions include riding quality, tie conditions, kind and amount of ballast, whether ballast is foul or clean, and the length of time since the track was last worked. The cross-elevation situation will aid in determining the degree to which spot tamping can be done before out-of-face raising is necessary in long stretches.

Raising, even in small amounts, cannot continue year after year in most places without affecting overhead and undergrade structures and necessitating additional work on fills. Even "light" out-of-face raising can no longer be considered under many overhead bridges, water facilities, signal bridges, or through terminals and electrified territories.

Economics always enter into any track-maintenance problem. How much money and how many men can be afforded? This, too, is interrelated with the over-all maintenance policy, but often falls short —far short—of the desired policy, when it comes to translating reduced expenditures and fewer man-hours into work accomplished. Although often overlooked, the ballast tonnage required for mile after mile of out-of-face raising can create a great expenditure and hence becomes one of the economic factors.

The light out-of-face raise is being rapidly discarded. In view of present-day economic and track conditions, it has to be. Track raising itself should be reviewed and weighed heavily against maintaining a constant track elevation and profile by newer track-working methods. Mechanical spot tamping of track seems to be the present answer to the interim maintenance of a "safe" railroad, short of a complete track rehabilitation.

Raise for Specific Purposes

By B. F. McDermott
Roadmaster, Chicago & North Western,
Brookings, S. D.

There are several factors that determine when a stretch of track should be given a light out-of-face raise or be spot surfaced. In general, a track should be raised out of face for any of the following reasons: (1) To correct center-bound track; (2) to improve drainage by raising the track out of ballast or to relieve "dead-riding" track; (3) to respace ties and make tie renewals; (4) to improve track that is too much out of cross level and line to spot surface to any degree of effectiveness; and (5) to take out long sags.

The ordinary surfacing performed by section forces consists in keeping both rails of straight track level and in maintaining the proper difference in elevation between the high rail and the low rail on curves. Short sags or dips are removed by raising the track that is low to meet the grade of the track on either side of the sags. The work of bringing low joints or similar low spots to proper surface or of taking out short dips in the track is considered spot surfacing, whereas the surfacing of longer stretches of track is called surfacing track out of face.

When a stretch of track is in fair line and surface a train moving at speeds up to 45 m.p.h. will ride fairly well even if one rail is as much as ½ in. lower than the other rail for long distances, but if short stretches are level while other short stretches are out of level more than ¼ in. the track will ride rough.

When a train passes over track in which a rail on one side is low and then a rail length or so on the opposite side is low, the cars will sway from one side to the other and the car trucks will strike against the rails. This will continue to drive the track more out of level and line than before. When track is in this condition for any considerable distance, it is then beyond the stage where smoothing up by spot surfacing would be effective. Such track should be given an out-of-face lift.

When a foreman makes his track

inspection, he can see such low joints and out-of-level conditions from his motor car. As these spots appear he should take care of them by spot surfacing before they develop into longer and rougher spots. When a stretch of track is neglected and not spot surfaced as the spots appear, the condition will get out of hand and before long the only remedy is to surface the track out of face.

The roadmaster should line up his section foremen to make it a part of his program to surface out of face such track that is buried or to take out sags that have been allowed to exist. As a rule, buried track heaves excessively in the winter season because the track cannot drain. This kind of track also rides "dead." In other words there is no "cushion" under the ties such as is necessary for good-riding track.

When such stretches of track are raised out of face, tie installations can be made much more easily and joint ties and intermediate ties can be properly spaced. The roadmaster should instruct the section foreman as to the amount of raise that is to be given a stretch of track that is to be surfaced out of face. Usually two inches is an ideal lift to relieve center-bound track and take up any excessive amount of ballast that may have buried the track. A two-inch lift will usually leave enough ballast to insure good drainage and for proper dressing of the track.

What Our Readers Think

ON 135-FT. TURNTABLES

Chicago

To the Editor:

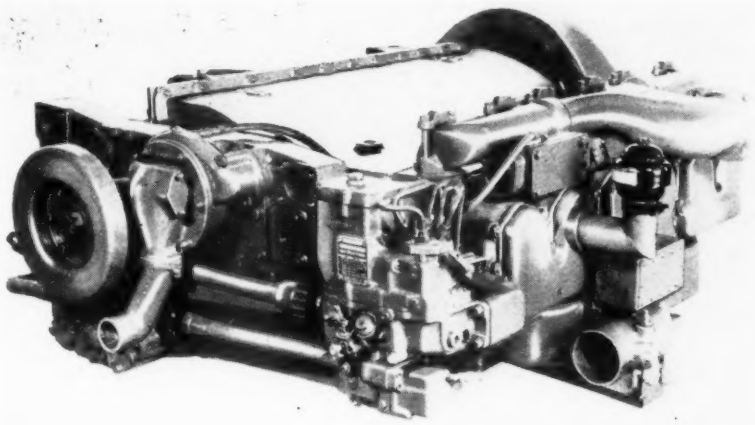
In the article in your December 1951 issue describing a new turntable installed on the New York Central, the statement is made that this 135-ft. turntable is said to be the longest this side of the Rocky Mountains. For your information the Burlington put in a 135-ft. turntable at Clyde, Ill. (Chicago) in 1940 and another at Galesburg, Ill., in 1945.

F. H. CRAMER
Bridge Engineer
Chicago, Burlington & Quincy

PRODUCTS OF MANUFACTURERS

New, improved equipment, materials, devices

(For additional information on any of these products, use postcards, page 367)



NEW HORIZONTAL DIESEL ENGINE

THE Cummins Engine Company, Inc., Columbus, Ind., has announced the availability of a new 200-hp. horizontal diesel engine. Designated as model NHHB-600, the engine is a six-cylinder full diesel, which operates at 2100 rpm, with a compression ratio of 15.5 to 1. Total displacement is 743 cu. in., with a bore and stroke of 5⅛ in. by 6 in. Because of its compactness the NHHB-600 is said to be particularly suited for installation in busses and rail cars. Dimensions of the new engine are: length, 63⅛ in.; width, 55¾ in.; and height, 22¾ in. The weight of the engine is 2285 lb.

SAFETY GOGGLE WITH INTERCHANGEABLE LENS

THE United States Safety Service Company, Kansas City, Mo., has developed a new all-plastic safety goggle, called the Saf-I-Duo, with a one-piece lens that is removable and interchangeable with the lens in this company's Saf-I-Spec, an all-plastic safety spectacle. Thus there can be furnished two different types of eye protection—a safety goggle and a safety spectacle—which require only one style of lens in case lens replacement is necessary.

The interchangeable lens is made of Optilite, a plastic material that meets government specifications in regard to optical qualities and resistance to impact. Both clear lenses and anti-glare green lenses are available. The goggle frame, made of soft Vinyl, is firm yet pliable enough to effect a tight seal between the frame and the wearer's face. Four different types of ventilation are available to meet various needs.

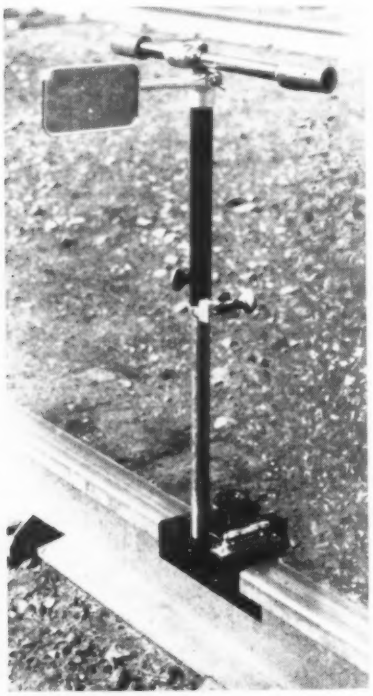
According to the manufacturer, the Saf-I-Duo goggle offers full

protection against flying particles, chemical splashes, and dusts. It is light in weight, attractive in appearance, and can be worn over corrective glasses.

For additional information on any of the products described on these pages, use postcards, page 367.

TRACK-LINING SCOPE

THE Hayco Lining Scope, manufactured by the Brice Hayes Company, Chicago, consists of a collapsible, mounted 6-power telescope, protected at the ends with Neoprene rubber tubes, which permits the operator to aline track for distances up to 500 ft. without moving the scope. A rear-view mirror is mounted at the left of the telescope as a safety factor for the operator. A vernier adjustment near the middle of the staff permits accurate alinement, and adjustments for height are made by a thumb screw on the left-hand side of the staff just above the vernier. When the scope is collapsed, it can easily be removed from the rail and transported with minimum danger to its delicate parts.

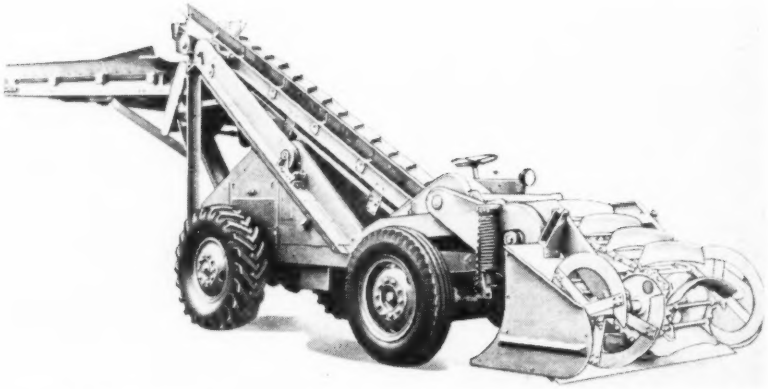


CRAWLER CRANE

THE American Hoist & Derrick Co., St. Paul, Minn., has announced a completely new ¾-yd. crawler crane, available with a choice of fronts—crane, shovel, dragline or pull shovel. This new crane, called the Model 375 BC, follows the same basic design as used in the manufacturer's 80-ton locomotive crane and 100-ton revolving crane, in that the machinery platform is an integral rolled-steel electrically welded unit, rather than the conventional cast center with bolted-on walkaways. This machine, which is in the 45,000 lb. class, is equipped with track pads which are double walled and special steel castings with full-length pins. The steel used is a special development that is said to reduce abrasive wear to a minimum, yet withstand the shock and strain of rough travel without breakage. A special alloy steel, is used in the boom.

Of significance is a high-speed boom hoist with a controlled lowering arrangement which is standard equipment. It is claimed that the boom radius may be changed with perfect control and without danger of dropping the boom since the boom lowers against the compression of the engine and can be lowered at any speed desired by the operator. The maximum lowering speed is the same as the maximum raising speed. The machine incorporates other features said to insure operator comfort, ease of control and safety. Ball-joint rod and bearings are used in the hoist, swing and travel linkage systems while anti-friction bearings are used in the brake linkage system. This feature is said to reduce pedal operating effort approximately 60 per cent and give the operator a better "feel" of the brakes. The shovel is equipped with an electric, push-button operated, dipper trip.

(*Please turn to page* 412)



WINDROW LOADER

A NEW stockpile-windrow loader has recently been announced by the Athey Products Corporation, Chicago. Called the Athey Force-Feed HiLoader, this machine has an auger gather-feeder which is said to speed up loading from stockpiles and wide windrows. The complete weeder unit is suspended from two coil springs and a pivot allowing the paddle blades to "float" over the contours of the windrow. The spiral auger blades extend to the moldboards of the unit and feed material inward to the paddle blades.

The 30-ft. conveyor belt of the loader is cleated to handle snow, sand and other light materials, as well as heavier earth, dirt, rock and the like. The swiveling discharge feature of the conveyor permits the swinging of the unit 45 deg. right or left of center. All operations are controlled hydraulically, with levers in easy reach of the operator's seat.

A 95-hp., 6-cylinder engine powers the unit which can travel at speeds up to 19 m.p.h. Loading speeds range through four gears from 0.3 to 1.92 m.p.h. Since the machine has a short wheel base, it is claimed that a non-stop turn can be made in 23 ft. The entire unit is 34 ft. 7 in. long and is said to have a loading capacity of 25 cu. yd. per minute in snow and up to 10 cu. yd. per minute in other materials.

"Look Bill" . . . "WE CAN'T KILL WEEDS — SITTING AT A DESK!"

DIV. ENG. "Well, what do you want to do?"

V. P. "I want you to get the best outfit in the country in here to discuss our problem."

DIV. ENG. "If that's the case, we had better call Reade."

V. P. "Why Reade?"

DIV. ENG. "I saw some work they did last summer for the P. D. & R. and the Susquehanna and Northern, and our conditions are almost identical with theirs. They got excellent results."

V. P. "Does Reade do contract spraying?"

DIV. ENG. "I'll say they do. They probably have the finest application equipment in the country."

V. P. "Well, get them in here, and in the meantime, let's figure what territories we want to spray."

READE EST 1883

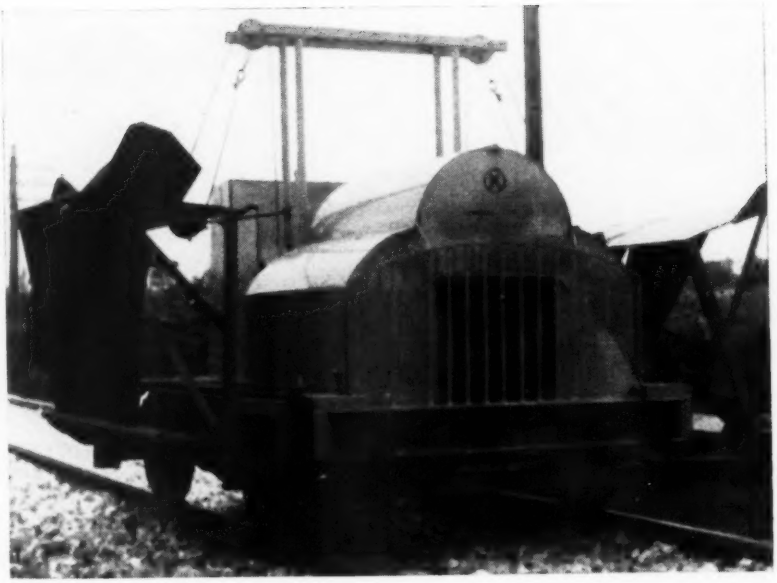
READE MANUFACTURING COMPANY, INC.
135 Hoboken Ave.
Jersey City 2, New Jersey

For additional information on any of the products described on these pages, use postcards, page 211.

BALLAST REGULATOR AND SCARIFIER

THE Kershaw Manufacturing Company, Inc., Montgomery, Ala., has recently announced the availability of the Kershaw Track Patrol Ballast Regulator and Scarifier. This machine is used with out-of-face surfacing gangs, and as a track patrol to scarify, de-weed, regulate, and shape the ballast shoulder. With surfacing gangs, it is used to regulate and distribute the ballast after unloading, and ahead of the surfacing gang. After surfacing is completed, the machine is used to regulate and shape the ballast slope, eliminating the entire crew normally used for this purpose.

Powered by an 85-hp. heavy-duty International GRD-233 engine, the Track Patrol consists of two ½-yd. regulator and dresser wings, complete with scarifying teeth, dresser and plow blades, all mounted on a track car.



The manufacturer claims that, on normal maintenance work, the machine, when assigned to a 250 mile section of track and operated by two men, is capable of scarifying, regulating, de-weeding, and shaping the ballast on from two to three miles of track per day.

ELECTRIC HAND LAMP

A NEW Big Beam portable electric hand lamp, known as Model No. 166, has been announced by U-C Light Manufacturing Co., Chicago. The outstanding feature of this latest addition to the Big Beam line is its hermetically sealed-beam bulb which is said to seal out dirt and moisture from the mirrored surface of the reflector and give

brilliant prefocused light. It is powered by a standard 6-volt lantern battery and its lamp-to-battery pressure-type contacts are said to permit battery replacement in seconds. The lamphead handle is chrome finished, and the battery case, with its hinged cover, is made of 20-gauge steel, is said to be weatherproof and rustproof, and is finished in red baked enamel.

600-CFM PORTABLE AIR COMPRESSOR

THE Ingersoll-Rand Company, New York, has recently announced the availability of a new 600-cfm portable air compressor mounted on rubber-tired wheels. Named the Gyro-Flow 600, this machine is said by the manufacturer to be relatively small and light in weight

The Gyro-Flow 600 incorporates a new type rotary compressor, containing no valves, pistons or clutch, which is driven by a General Motors Series 71 diesel engine. Some of the outstanding features of this machine, as pointed out by the manufacturer, are: Two-stage compression with oil-injection cooling; air discharge temperature of below 200 deg.; separate cooling systems for the engine and the compressor; Air-Glide capacity control, which maintains the output of 600-cfm at 100 psi; and hinged side covers

ALADDIN LUBRICATOR

$178.00 delivered

Only one moving part:

The "Aladdin" has no pumps or valves. A spring-loaded piston, the *only* moving part, descends in a cylinder under vibration from traffic—and delivers the required amount of standard grease *automatically* to the running side of the rail.

One-man installation:

No track alteration, rail drilling or gauge widening is required to install the "Aladdin". And since it weighs only 50 pounds—it can be handled and installed by one man *in less than half an hour.*

Proved performance:

Today, thousands of "Aladdin" Lubricators are in use on main lines... in yards... under one or two-way traffic... in all climates. The "Aladdin's" low cost means you can now economically specify a lubricator for *every* rail wear location. Why not check *your* lubricator requirements today? Write for Bulletin A.

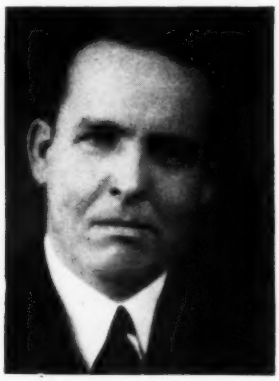
H. T. KENNEDY COMPANY, Inc., 37 Wall St., New York 5, N.Y.

THE MONTH'S NEWS

Railway Personnel

General

J. P. Newell, who was recently appointed vice-president, operation, of the Pennsylvania, with headquarters at Philadelphia (RE&M, February, p. 159), was born at Carthage, Mo., on September 18, 1902, and received his civil engineering degree from Princeton University in 1924. He joined the Pennsylvania in 1927 as an assistant on the engineer corps on the Pittsburgh division, serving as supervisor of track and division engineer at various locations until 1940, when he



J. P. Newell

became superintendent of the Logansport division. He was subsequently superintendent at St. Louis, superintendent freight transportation at Chicago, and general superintendent at Indianapolis and Harrisburg, and in June 1948 was appointed general manager of the Western region at Chicago. In June 1951 he was advanced to assistant vice-president, operation, which position he held until his recent appointment.

Walton E. Smith, inspector of operation on the Erie, and formerly assistant division engineer at Salamanca, N. Y., has been promoted to trainmaster at Jersey City, N. J.

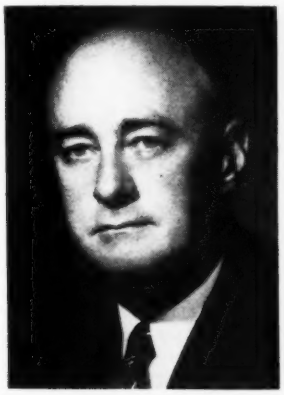
Joe R. Goodman, supervisor of track on the Southern at Keysville, Va., has been appointed assistant trainmaster at Chamblee, Ga. and **William R. Smith,** supervisor of track at Cordele, Ga., has been appointed assistant trainmaster-supervisor at Valdosta, Ga.

H. G. Dennis, district maintenance engineer on the Chicago, Rock Island & Pacific at Kansas City, Mo., has been promoted to superintendent of the Panhandle division at Liberal, Kan.

John W. Smith, vice-president (administration) of the Seaboard Air Line, and an engineer by training and experience, has been elected president with headquarters as before at Norfolk, Va. Mr.

Smith, born in Baltimore, Md., on July 20, 1900, was graduated from the University of Maryland in 1921 with a Bachelor of Science degree in civil engineering. He was employed as a building construction engineer by several firms during 1921-23 and as a junior engineer with the United States Coast & Geodetic Survey at San Francisco from August 1923 to March 1924. His railroad career began in April 1924 when he joined the Virginian as an engineer computer at Norfolk. In November of that year he joined the Seaboard—with which he has been associated ever since—as an engineer inspector at Norfolk, Va.

In succession, Mr. Smith held the posts of assistant division engineer, Jacksonville, Fla.; chief clerk to engineer maintenance of way; assistant roadmaster; division engineer, first at Atlanta, Ga.,



John W. Smith

and later at Savannah; supervisor, betterments and contracts; and trainmaster at Hamlet, N. C., and Richmond, Va. From September 1942 to June 1944 he was superintendent at Howells, Ga. On the latter date he was appointed assistant chief engineer at Norfolk, holding that position until January 1946, when he became assistant general superintendent at Savannah. In August 1946 he returned to Norfolk as assistant to president, being elected vice-president (administration) in December 1950.

Engineering

J. A. Holmes has been appointed assistant construction engineer of the Southern Pacific, at San Francisco, Cal.

Harold L. Paxton, assistant engineer on the Western region of the Pennsylvania, with headquarters at Chicago, has retired after 47 years of service.

Lawrence T. Ferguson has been appointed to the newly created position of engineer of track on the Union Pacific, with headquarters at Omaha, Neb.

S. Turner Watson, senior assistant engineer on the Atlantic Coast Line at Florence, S. C., has been appointed division engineer with headquarters at Savannah, Ga.

(*Continued on next page*)

Railway Personnel (Cont'd)

A. L. McHenry, has been appointed division engineer on the Northwestern Pacific at San Rafael, Cal., succeeding **J. F. Lockhart,** who has been assigned to other duties.

C. J. Randall, supervisor of track on the New York Central at Malone, N. Y., has been promoted to assistant division engineer at Watertown, N. Y., to succeed **W. R. Benish,** who has been transferred to Weehawken, N. J.

C. J. Harrington, supervisor of track on the East St. Louis Terminal division on the Illinois Central, has been promoted to assistant to division engineer on the Iowa division, line west at Waterloo, Iowa, to succeed **J. H. Davis,** deceased.

James Hope has been appointed engineer of work equipment for the Chicago, Rock Island & Pacific with headquarters at Chicago. Mr. Hope was formerly vice president in charge of coal mining operations of the Rock Island Improvement Company, a Rock Island Lines subsidiary, at Peoria, Ill.

R. W. Middleton, division engineer of the Trans-Missouri division of the Chicago, Milwaukee, St. Paul & Pacific, has been appointed division engineer of the Rocky Mountain division at Butte, Mont. He succeeds **W. E. Ring,** who has retired after 38 years of service. **H. E. Hurst,** assistant engineer-construction, succeeds Mr. Middleton at Miles City, Mont.

J. B. Gregory, senior assistant division engineer on the Seaboard Air Line, has been appointed division engineer, with headquarters as before at Raleigh, N. C., to succeed **Vance Sykes,** who has retired after 42 years of service. **J. F. Warrenfells, Jr.,** master carpenter at Savannah, Ga., has been named senior assistant division engineer to replace Mr. Gregory, **J. R. Fraser,** assistant to division engineer at Raleigh, has been advanced to assistant division engineer, and **J. J. Vereen,** student engineer at Raleigh, has been promoted to succeed Mr. Fraser.

G. B. Alexander, district engineer on the Canadian Pacific at Moose Jaw, Sask., has been promoted to assistant engineer maintenance of way at Winnipeg, Man., to succeed **W. G. Dyer,** whose appointment as engineer maintenance of way was noted in the January issue. **J. Cherrington,** division engineer at Nelson, B. C., has been advanced to assistant district engineer at Vancouver, B. C., to succeed **E. C. B. Macnabb,** whose appointment as district engineer at Moose Jaw also was noted in the January issue. Mr. Cherrington has been succeeded by **G. G. Fyke,** division engineer at Penticton, B. C., and **A. F. Joplin,** roadmaster at Brookmere, B. C., has been promoted to replace Mr. Fyke.

R. G. Schultz, whose promotion to special assistant engineer on the Texas & New Orleans at Houston, Tex., was recently announced (R.E.&M., February, p. 164), was born August 8, 1901, at Victoria, Tex. He entered the service of the

For additional information, use postcard, pages 367-368

Texas & New Orleans in 1914 where he served as office boy, clerk, rodman and instrumentman until 1921 when he was appointed assistant engineer on construction. He served as assistant engineer on the Houston division until 1932 when he was named bridge inspector at that location. After serving in the armed forces, he returned to Houston as assistant division engineer in 1945, and in 1947 was promoted to division engineer of the San Antonio division, the position he held at the time of his recent promotion to special assistant engineer.

R. E. Caudle, assistant engineer of structures on the Missouri Pacific at Houston, Tex., has retired after 36 years of service with that road. Born at Clarksville, Tex., August 10, 1886, he entered railroad service with the Kansas City, Mexico & Orient. In March, 1911, he entered the service of the Texas & Pacific and served as instrumentman and division

R. E. Caudle

engineer until August 1, 1915, when he joined the Missouri Pacific as instrumentman at Mart, Tex.

Since the latter date, Mr. Caudle has served successively as division engineer and supervisor of bridges and buildings at San Antonio, Tex., division engineer and assistant engineer of structures at Palestine, Tex., and office engineer, principal assistant engineer, and assistant engineer of structures at Houston.

K. A. Truman, whose promotion to district engineer of the Alberta district of the Canadian Pacific at Calgary, Alta., was recently announced (R.E.&M., January, p. 78), was born June 8, 1911, at Craik, Sask. He received his degree in civil engineering from the University of Manitoba in 1935 and entered the service of the Canadian Pacific in May 1929 as a chainman in the construction department.

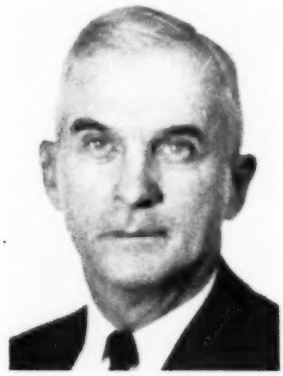
Mr. Truman served as a transitman at various locations from 1937 until 1944 when he was appointed roadmaster at Manyberries, Alta. In the latter part of 1944 he was named division engineer at Medicine Hat, Alta., where he served until 1950 when he was promoted to assistant district engineer at Vancouver, B. C. In the latter part of 1950 he was named special engineer of the Alberta district with headquarters at Calgary, the position he held prior to his recent promotion to district engineer.

(Continued on next page)

Railway Personnel (Cont'd)

with headquarters at Calgary, the position he held prior to his recent promotion to district engineer.

Howard F. Passel, whose retirement as division engineer of the Baltimore & Ohio, at Indianapolis, Ind. was recently announced (R.E.&M., February, p. 161), was born January 23, 1883 at Cincinnati, Ohio. He received his education in civil engineering at the University of Cincinnati and entered railroad service April 1, 1901 as a rodman on the Cincinnati, Hamilton & Dayton at Hamilton, Ohio. From April 1, 1905, to January 1, 1906,



Howard F. Passel

he served as assistant engineer on that road at Dayton, Ohio, and on the latter date was appointed division engineer at Chillicothe, Ohio, and Dayton. On January 1, 1913, he was transferred to Indianapolis, Ind., where he served until December 1, 1915, when he became chief engineer on the Cincinnati, Indianapolis & Western, at Indianapolis, Ind. On June 1, 1916, he was named division engineer on the Baltimore & Ohio at Indianapolis, Ind., the position he held until he retired.

R. C. Heckel has been appointed assistant division engineer of the Michigan division of the New York Central at Jackson, Mich., succeeding **J. D. Fraser,** who has been promoted to division engineer at Columbus, Ohio, succeeding **K. E. Dunn,** division engineer of the Ohio Central division of the New York Central at Columbus, Ohio, who has been appointed special engineer, office of vice-president, with headquarters at Chicago, succeeding **L. O. Lower,** who has retired after 45 years of service.

R. H. Meintel, assistant division engineer on the Pennsylvania at Pittsburgh, Pa., has been appointed assistant engineer in the office of chief engineer maintenance of way at Philadelphia, to succeed **A. P. Talbot,** who has been appointed assistant to chief engineer maintenance of way, with the same headquarters. **H. W. Seeley, Jr.,** supervisor of track at Wilmington, Del., has been promoted to assistant division engineer at Pittsburgh to succeed Mr. Meintel. **H. R. Rockenbach,** supervisor of structures on the Northern

division, has been appointed office engineer on the Pittsburgh-Conemaugh divisions to replace **G. M. Sauvain,** who has been appointed assistant engineer, office of the chief engineer maintenance of way, Central region.

L. C. Smith, whose retirement as division engineer of the Madison division of the Chicago & North Western at Madison, Wis., was recently announced (R.E.&M., February, p. 161), was born on December 6, 1886, at Columbia, S. D. He entered the service of the North Western in 1904 as a chainman. During 1912 and 1913 he was residence engineer on railway relocation and double-track work with the Chicago, Milwaukee, St. Paul & Pacific, and from 1914 to 1915 was superintendent of railroad construction for that road. From 1915 to 1917, Mr. Smith was assistant engineer on the Minneapolis, St. Paul & Sault Ste. Marie, where he was engaged in valuation, construction and maintenance work. From 1917 to 1919, Mr. Smith served as assistant engineer on the St. Louis-San Francisco, and from 1919 to 1929 served as assistant engineer and resident engineer on the Soo Line. He re-entered the service of the North Western in 1930 and served consecutively as instrumentman, assistant engineer, roadmaster, supervisor bridge and buildings, and division engineer of the Black Hills, Peninsula and Madison divisions, the latter position being the one he held at the time of his retirement.

Track

Andrew Bell, Jr., assistant supervisor of track on the New York Central at Oneida, N. Y., has been promoted to supervisor of track at Malone, N. Y., to succeed **C. J. Randall,** whose appointment as assistant division engineer at Watertown, N. Y., is noted elsewhere in these columns.

E. J. Brosnahan, whose promotion to supervisor of track on the Illinois Central at Pana, Ill. was recently announced (R.E.&M., February, p. 166), was born February 3, 1911, at Pontiac, Ill. He entered the service of the Illinois Central on July 11, 1927, and served as section foreman and extra gang foreman on the Illinois division until May 15, 1951, when he was promoted to general foreman of track on the Illinois division with headquarters at Mattoon, Ill. On November 15, 1951, Mr. Brosnahan was promoted to acting supervisor of track at Mattoon, which position he held prior to his recent promotion.

Charles A. Ford, who has been appointed supervisor of track on the New York Central at Corning, N. Y., as announced in the February issue, was born at Brooklyn, N. Y., on April 21, 1907. Entering the service of the New York Central on August 16, 1928, as a laborer at Hudson, N. Y., he was subsequently employed as a timekeeper at that location and a section foreman at Germantown, N. Y. In 1946 Mr. Ford was appointed assistant supervisor of track at Brewster,

(*Continued on next page*)

N. Y., later serving as general foreman at Utica. He resumed the position of assistant supervisor of track at Utica in 1948, where he remained until his recent promotion to supervisor of track.

Wolters Ledyard, whose promotion to supervisor of track on the New York Central at Watertown, N. Y., was announced in the February issue, was born at Brooklyn, N. Y., on May 8, 1913, and received his higher education at Syracuse University. Entering the employ of the New York Central as a chainman in the engineering department at New York on October 1, 1940, Mr. Ledyard subsequently served as rodman and draftsman until October 1, 1944, when he was appointed assistant supervisor of track at Rochester, N. Y. On July 1, 1947, he was named bridge and building inspector at Pittsfield, Mass., and served in that capacity until January 1, 1949, when he resumed the position of assistant supervisor of track at Albany, N. Y. He was appointed assistant engineer in the office of engineer maintenance of way at New York on November 1, 1950, the position he held until his recent promotion.

R. L. Williams, supervisor of track on the Iowa division of the Illinois Central at Freeport, Ill., has been transferred to the East St. Louis Terminal division, succeeding **C. J. Harrington,** whose promotion to assistant to division engineer of the Iowa division, line west, at Waterloo, Iowa, is reported elsewhere in these columns. **H. L. Hood,** supervisor of track of the St. Louis division Central at Carbondale, Ill., has been transferred to the Iowa division at Waterloo, succeeding Mr. Williams. **S. D. Burton,** supervisor of track on the St. Louis division at Bluford, Ill., has been transferred to Carbondale, succeeding Mr. Hood. **Carl C. Jackson,** section foreman on the St. Louis division has been promoted to supervisor of track at Bluford, Ill., succeeding Mr. Burton.

M. K. Clark, supervisor of track on the Lake division on the Pennsylvania at New Castle, Pa., has been transferred to the Ft. Wayne division, Ft. Wayne, Ind., succeeding **T. C. Netherton. A. J. Syvertsen,** assistant supervisor of track on the Pittsburgh division at Pittsburgh, Pa., has been promoted to supervisor of track on the Southwestern division at Columbus, Ind., succeeding **D. D. Drake.**

R. E. Gorsuch, supervisor of track on the Pennsylvania at Northumberland, Pa., has been transferred to Wilmington, Del., to succeed **H. W. Seeley, Jr.,** who as announced elsewhere in these columns, has been promoted to assistant division engineer at Pittsburgh, Pa. **R. F. Cole,** assistant superviser of track at Huntingdon, Pa., has been advanced to supervisor of track at Northumberland to succeed Mr. Gorsuch. **H. D. Tietjen,** assistant supervisor of track at Newport, Pa., has been promoted to supervisor of track at Huntingdon, and **R. W. Heard,** junior engineer at Huntingdon, has been promoted to assistant supervisor at Newport to replace Mr. Tietjen. **D. G. Avoletta,** supervisor of track, office of the chief engineer, Eastern region, has been transferred to Enola, Pa., to succeed **N. L. Hochlander,** who has been transferred to Harrisburg, Pa. **H. T. Matthews,** foreman of track at Baltimore, Md., has been appointed supervisor of track to succeed Mr. Avoletta. **W. M. McCracken,** supervisor of track at Trafford, Pa., has been appointed supervisor of safety on the Pittsburgh division.

John W. Staley, assistant supervisor of track on the Southern at John Sevier, Tenn., has been promoted to supervisor of track at Cochrane, Ga., to succeed **Donald H. MacLeod,** who has been transferred to Asheville, N. C. **Royce D. Moon,** supervisor of track at Valdosta, Ga., has been transferred to Cordele, Ga., to replace **William R. Smith,** who, as noted elsewhere in these columns, has been appointed assistant trainmaster-supervisor at Valdosta. **Marvin E. Wilson, Jr.,** assistant supervisor of track at Columbia, S. C., has been advanced to supervisor of track, with headquarters as before at Greenwood, S. C. **Terence O'Brien,** assistant supervisor of track at Mooresville, N. C., has been promoted to supervisor of track at Orangeburg, S. C. **George S. Baron,** assistant supervisor of track at Cincinnati, Ohio, has been appointed supervisor of track at Laurel, Miss. **Robert A. Wharton,**

assistant supervisor of track at New Albany, Ind., has been promoted to supervisor of track at Oxford, Ala., to succeed **William A. Long,** who has retired after 46 years of service. **Luther V. Armstrong,** section foreman on the Charleston division, has been advanced to assistant supervisor of track on that division, and **Robert G. Reid,** section foreman at Swannanoa, N. C., has been advanced to assistant supervisor of track at Morristown, Tenn.

Water Service

P. J. Calza has been appointed engineer of water service on the Chicago, Rock Island & Pacific, with headquarters at Chicago.

M. F. Shane, whose promotion to assistant engineer, water and fuel service, on the Texas & New Orleans at Houston, Tex., was recently announced (R.E.&M., February, p. 164), was born April 26, 1909, at Welsh, La. He received his degree in mechanical engineering at the University of Texas in June 1932 and entered the service of the Texas & New Orleans as a messenger boy in the yard office at Beaumont, Tex., in September of that year. Mr. Shane later served as rodman, senior rodman and levelman in the division engineer's office at Houston until August 1944 when he was transferred to the division engineer's office at Austin, Tex., where he served as estimator-draftsman, the position he held at the time of his recent promotion.

Bridge and Building

J. N. McConnell, bridge and building master on the Montreal Terminals division of the Canadian Pacific, has been transferred to the Laurentian division to succeed **J. A. Rose,** who, in turn, has been transferred to the Montreal Terminals division.

J. P. Witherspoon, master carpenter on the Seaboard Air Line at Atlanta, Ga., has been transferred to Savannah to succeed **J. F. Warrenfells, Jr.,** who, as noted elsewhere in these columns, has been promoted to senior assistant division engineer at Raleigh, N. C. **J. M. Eargle,** bridge foreman at Atlanta, has been advanced to master carpenter to replace Mr. Witherspoon.

H. S. Hildebrand, assistant supervisor of structures on the Eastern division of the Pennsylvania, has been promoted to supervisor of structures on the Northern division to succeed **H. R. Rockenbach,** who, as noted elsewhere in these columns, has been appointed office engineer on the Pittsburgh-Conemaugh divisions, and **D. C. Fisk,** Junior engineer—bridges and buildings, has been appointed assistant supervisor of structures to replace Mr. Hildebrand.

Special

Robert B. Radkey, who was recently promoted to assistant to engineer of ties,

(*Continued on next page*)

Railway Personnel (Cont'd)

treatment and tests on the Illinois Central at Chicago (RE&M, February, p. 167), graduated from the University of Michigan in 1942. He entered the service of the Illinois Central on April 4, 1946, as a junior engineering aide at Clinton, Ill., and in October 1947 was transferred to the bridge department at Chicago. From March 1948 until June 1950, Mr. Radkey served as assistant supervisor of track on the Illinois and Chicago Terminal divisions, and on the latter date was promoted to supervisor of track at Pana, Ill., the position he held prior to his recent promotion.

Obituary

Henry T. Davis, retired supervisor of track on the Southern died recently.

Frank C. Seman, track supervisor on the Greenwood Lake division of the Erie, died recently at the age of 34 after an illness of several months.

C. U. Smith, retired district engineer of the Chicago, Milwaukee, St. Paul & Pacific, died in February in California.

Robert R. Cummins, vice-president and general manager of the Central of Georgia, died on February 26 at the age of 67. During his nearly 43 years of service with the C. of Ga., Mr. Cummins had held various positions in the engineering department and from 1933 to 1936 served as acting general manager and chief engineer.

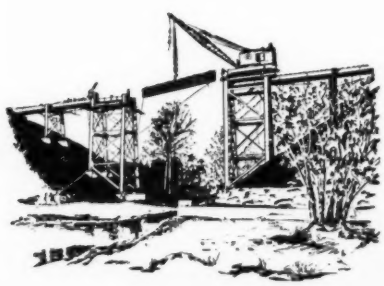
Edward A. Dougherty, chief engineer of the New York Central, Lines West of Buffalo, died on February 26 at Chicago at the age of 65.

Mr. Dougherty, who spent his entire career with the New York Central since his graduation from Columbia University's School of Mines in 1910, was born in New York, December 14, 1886. From 1910 to 1917 he worked on the electrification of the line between Mott Haven, N. Y., and Croton-on-Hudson, and also on the third and fourth tracking of the road at various points. In 1917, he became assistant engineer in the valuation department, and in 1919 was promoted

Edward A. Dougherty

to assistant engineer in the office of the corporate chief engineer and assistant to the president. In 1927 he was promoted to designing engineer at New York, and in 1935 became assistant chief engineer there. In 1938, he was transferred to assistant to vice-president of the Lines West at Chicago, and in 1943 became assistant general manager at Cleveland, Ohio. He was promoted to his present position on November 15, 1945.

Among the major improvements which Mr. Dougherty helped supervise in recent years were the construction of the new passenger station at Toledo, Ohio, the Lakefront Dock & Railroad Terminal at Toledo, and the Syracuse (N. Y.) crossing elimination.



Association News

American Railway Engineering Association

The fifty-first annual meeting of the association was held at the Palmer House, Chicago, March 11-13. A highlight story of the meeting, including a list of the newly-elected officers and illustrated with photographs of many of the members who attended the meeting, will be found in the feature section of this issue.

By action of the Board of Direction at a meeting held immediately following the close of the convention, the 1953 annual convention of the association will be held at the Palmer House, Chicago, on March 17-19. It was also decided that President C. J. Geyer would call a meeting of all chairmen of the standing and special committees of the association to be held at Chicago on April 28. Following this meeting the Board of Direction will hold a brief session.

Bridge and Building Association

A meeting of the Executive committee of the association was held at the Chicago Engineers' Club on March 10, a day preceding the opening of the annual convention of the American Railway Engineering Association. With President G. E. Martin presiding, the committee discussed various routine matters, including the selling of advertising in the 1951 Proceedings and preliminary plans for the 1952 convention in September. A rather unusual feature of the meeting was that chairmen of a number of the technical committees preparing reports for presentation at the next convention were present to discuss the work of their respective committees. It was decided that the next meeting of the Executive committee would be held on July 21.

Metropolitan Maintenance of Way Club

The annual meeting of the club will be held at 6:30 p.m. on Thursday, April 24, at the Hotel Shelburne, New York. This meeting will be featured by an open forum discussion on the Lackawanna system of maintenance, which will be conducted by J. P. Hiltz, engineer maintenance of way, Delaware, Lackawanna & Western, Scranton, Pa. Following the regular program the annual election of officers will be held.

Maintenance of Way Club of Chicago

Problems, and the methods and techniques used to solve them, in constructing 350 miles of railroad in the far north were the subject of discussion at the March meeting of the club, held on the 24th at Eitel's restaurant in the Field Building, Chicago. The speakers were Jack W. Buford and Morris A. Bradley, both of the M. A. Hanna Company, Cleveland, Ohio, which is involved in the construction of a railroad to reach a rich ore deposit in Canada. A moving picture was shown.

The next meeting will be held at the same location on April 28. The speaker at this meeting will be C. J. Geyer, vice-president—construction and maintenance, Chesapeake district, Chesapeake & Ohio, whose subject will be "Management's Views on Maintenance of Way." Mr. Geyer is the newly-elected president of the American Railway Engineering Association.

National Railway Appliances Association

The annual meeting of this association was held on March 11 at the Coliseum at Chicago where the association was holding an exhibit in connection with the annual convention of the American Railway Engineering Association. In the election of officers at the N.R.A.A. meeting Jess Mossgrove (Baldwin-Lima-Hamilton Corporation), was advanced from vice-president to president; W. H. Tudor (International Harvester Company), was advanced from treasurer to vice-president; R. A.

(Continued on next page)

Association News (Cont'd)

Carr (Dearborn Chemical Company), secretary of the association, was elected treasurer; and J. B. Templeton (Templeton, Kenly & Co.) was elected secretary. Directors elected for three years are: Eugene Harbeck (National Lock Washer Company); K. I. Thompson (Oxweld Railroad Service Company); and G. R. Betts (Armco Drainage & Metal Products, Inc.).

Roadmasters' Association

Under the direction of President A. H. Whisler the Executive committee of the association held a meeting on Monday, March 10, in the Chicago Engineers' Club, which was a day in advance of the opening of the annual convention of the American Railway Engineering Association. It developed during the meeting that the Proceedings of the 1951 convention would be mailed to members late in March. In addition to other routine business, preliminary plans for the 1952 annual meeting were discussed. This discussion brought out the fact that unusually elaborate plans are being made for entertaining the wives of members during the meeting. The next meeting of the Executive committee will be held on May 26.

Meetings and Conventions

American Railway Bridge and Building Association—Annual meeting, September 15-17, 1952, Conrad Hilton (Stevens) Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

American Railway Engineering Association—Annual Meeting. March 17-19, 1953, Chicago. Neal D. Howard, Secretary, 59 E. Van Buren street, Chicago 5.

American Wood-Preservers' Association—Annual meeting, April 22-24, 1952, Hotel New Yorker, New York. W. A. Penrose, Secretary-treasurer, 839 Seventeenth street, N. W., Washington 6, D. C.

Bridge and Building Supply Association—L. R. Gurley, Secretary, 201 North Wells street, Chicago 6.

Maintenance of Way Club of Chicago—Next meeting April 28. E. C. Patterson, Secretary-treasurer, Room 1512, 400 W. Madison street, Chicago 6.

Metropolitan Maintenance of Way Club—Secretary, 30 Church street, New York.

National Railway Appliances Association—Robert A. Carr, Secretary, 310 South Michigan avenue, Chicago 4; Lewis Thomas, Assistant Secretary, 59 East Van Buren street, Chicago 5.

Railway Tie Association—Annual meeting, October 22-24, 1952, Jung Hotel, New Orleans, La. Roy M. Edmonds, Secretary-treasurer, 912 Shell Building, St. Louis 3, Mo.

Roadmasters' and Maintenance of Way Association of America—Annual meeting, September 15-17, 1952, Conrad Hilton (Stevens) Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

Track Supply Association—Lewis Thomas, Secretary, 59 E. Van Buren street, Chicago 5.

Supply Trade News

General

Cummins Diesels are now being sold and serviced in Eastern and Central Iowa by **Cummins Diesel Sales Corporation** through a new sales and service outlet at University and Illinois Streets, Des Moines. Territory for the new outlet will include these portions of Iowa, with the exception of Scott county.

Personal

A. O. Putnam has recently been named advertising manager of **Layne & Bowler, Inc.**, Memphis, Tenn.

J. Donald Hadden has joined the **Walton R. Collins Company**, and the **Collins Oil & Manufacturing Co., Inc.**, New York.

J. P. Steelman has been elected president and **E. A. Brugger** has been elected vice-president and general manager of the **Koehring Company**, Milwaukee, Wis.

Arthur Templeton has been appointed Southwestern Divisional sales engineer for **Templeton, Kenly & Co.**, Chicago. Mr. Templeton will cover the states of Texas, Oklahoma and Louisiana from headquarters at Dallas, Tex.

Warren Tool Corporation has announced the appointment of **Karl F. Baumann** as vice-president in charge of sales at Warren, Ohio. Mr. Baumann started with this company in 1944 as assistant sales manager. After gaining valuable knowledge of heavy hand tools and their

Karl F. Baumann

sales, he was made works manager at Warren in 1947. Shortly after graduating from the University of Wisconsin in 1930, Mr. Baumann became associated with Globe Union, Inc., Milwaukee with which company he served in various capacities, such as personnel manager, special assistant to the vice-president in charge of sales, and assistant sales manager.

Trade Publications

(To obtain copies of any of the publications mentioned in these columns, use postcards, page 367).

Pumps & Well Water Systems—Two new booklets have recently been issued by Layne & Bowler, Inc., Memphis, Tenn. Bulletin SCP-50 is a 16-page presentation of Layne short-coupled service pumps. In addition to explaining the basic principles of pump construction and operation, it contains drawings, photographs and text which describe in detail various Layne pumps, their capacities and specifications, and typical installations.

Another publication, designated WS-50, contains, in 48 illustrated pages, descriptive material related to Layne-water systems. This booklet explains the design, installation and operation of various types of wells, including gravel-wall wells, cemented wells, rock wells and artesian wells. Other sections of the booklet are devoted to Layne special drilling services, water treatment and conditioning, and Layne vertical turbine pumps. The last eleven pages of the booklet contain an assortment of engineering tables and formulae related to hydraulics of well design.

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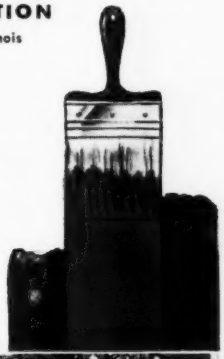

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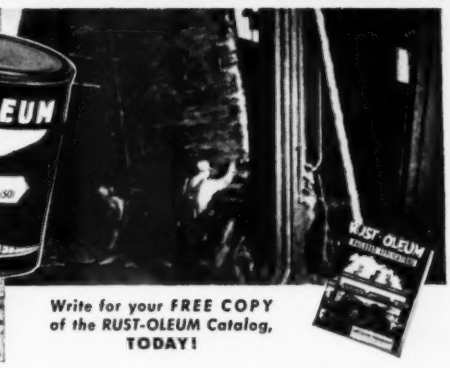

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